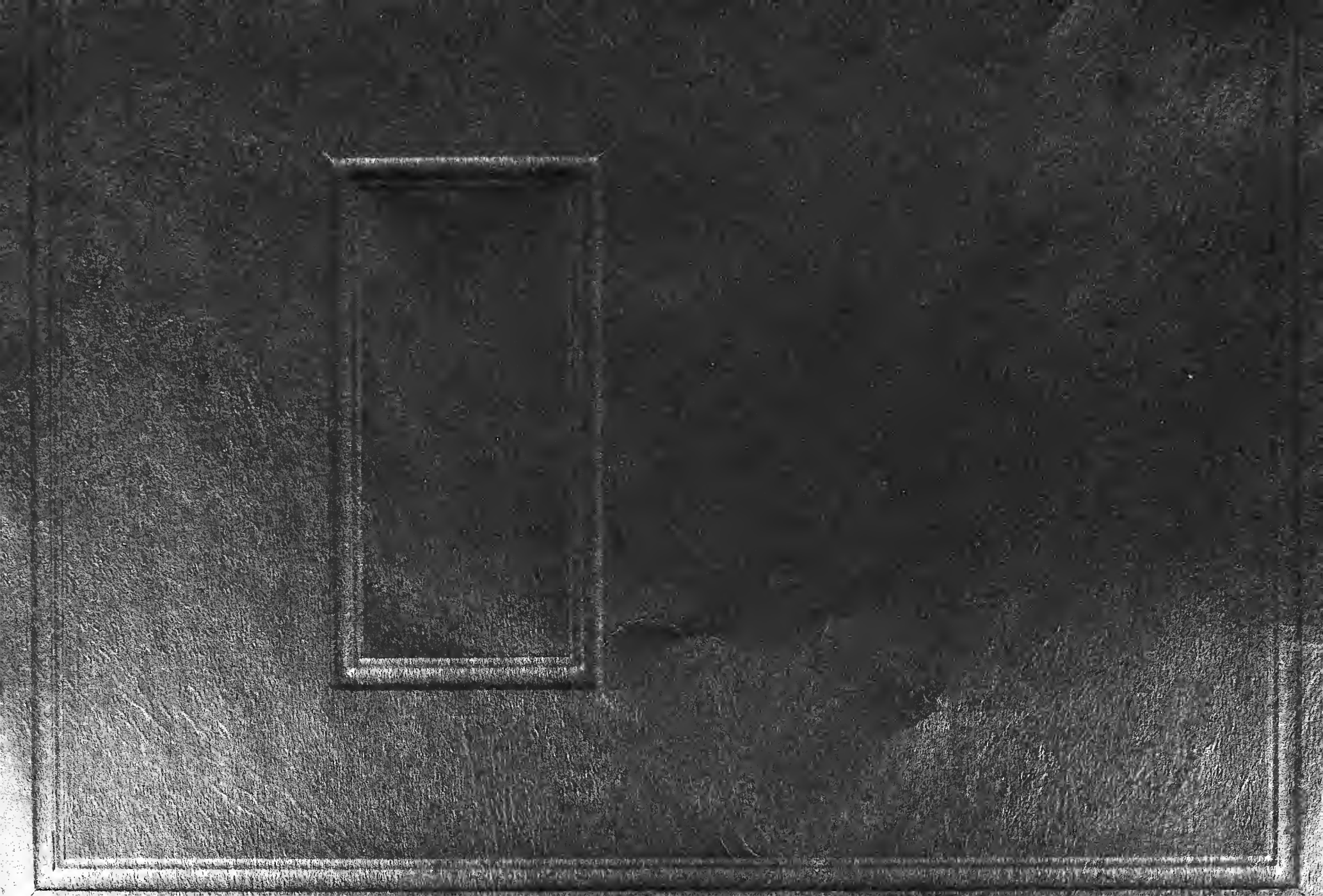
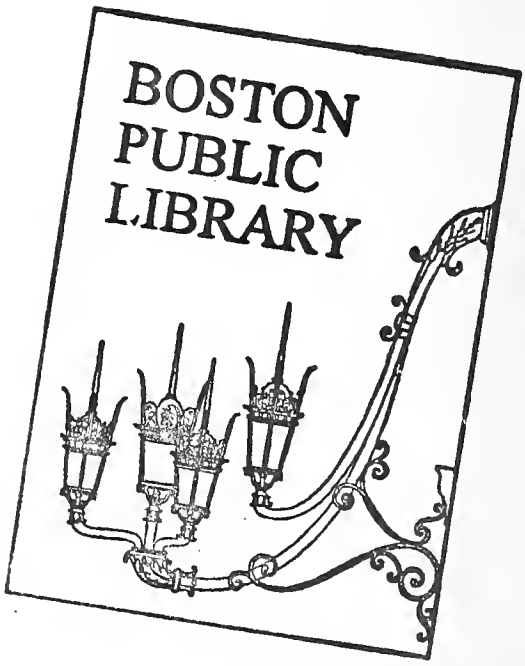
REPORT NO. 5
FEASIBILITY STUDY
MULTI-STORY LIGHT MANUFACTURING PLANT
SOUTH END URBAN RENEWAL AREA
BOSTON, MASSACHUSETTS





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[illegible]

PART I - [illegible]

Basis Requirement

The basic requirement of this study is to identify documentable the Boston Redevelopment Authority and to subsidized private developers the feasibility of building industrial buildings for lease at the lowest possible rentals in the South End Urban Renewal Area. The study is intended to include a prototype multi-story building of low cost architectural quality and appearance for light industrial purposes by the use of drawings, specifications, analyses and cost data.

Scope of Study

There are numerous diverse problems which must be carefully analyzed by the Designer in order to produce a multi-story prototype for industrial use with maximum flexibility that will meet the functional requirements of a wide variety of prospective tenants. These various problems are thoroughly discussed in the report. The prototype must be of good architectural and structural quality. In order to be commercially feasible, it must be erected at a cost which will permit rental of lease space at a price which is competitive with existing available factory properties, yet offers adequate facilities which these existing facilities lack.

To fulfill the requirements of this study, the text is divided into the following parts each of which is an important facet of the overall scope:

PART II — Transportation of Sites to the Project Area for Prototype Building

PART III — Transportation Facilities

PART IV — Typical Occupants of Prototype Industrial Building and their Requirements

PART V [illegible]

PART VI [illegible]

PART VII Outline Specifications

PART VIII Preliminary Engineering Data Estimates

PART IX Drawings

PART II - RECOMMENDATIONS AS REGARDS THE PROPOSED NEW POLICE HEADQUARTERS STUDIES

Site Locations

The Boston Redevelopment Authority has given the designers a copy of a map developed by them entitled "South End Urban Renewal Area". Certain sites in the project area are designated as Industrial. One of these sites is located in the Castle Square area, another is located adjacent to Mt. Hope Street and the third which is a smaller site is located adjacent to the Fitzgerald Expressway at the Melnea Cass Boulevard.

Castle Square Site

The Castle Square site is bounded by Dover Street, Tremont Street, Herald Street and Washington Street. Shawmut Avenue divides the site in a north-westerly direction about 300 feet from Washington Street. Holy Trinity Church might be involved on the latter block and is entirely industrial installations on the remainder of Herald Street and Shawmut Avenue are not slated for demolition. The industrial installations are indicated in this block, fronting on Washington Street for a distance of approximately 300 feet from Herald Street and approximately 200 feet in depth. The remainder of this block is allocated to housing and a shopping center.

The plan indicates that the block bounded by Dover Street on the south, Tremont Street on the west, Herald Street on the north and Shawmut Avenue on the east is allocated to housing and industry. The industrial installations is to occupy a triangular portion of the block at the corner of Tremont Street and Herald Street. The block is about 960 feet in the north-south direction and 800 feet in the east-west direction. Herald Street from the east-west leg of the triangular portion allocated to the industrial installation for a distance of about 560 feet from Tremont Street and the north-south leg is formed by Tremont Street for a distance of about 560 feet. A portion of the block at the corner of Herald Street and Shawmut Avenue, approximately 200 feet by 160 feet is allocated to a parking garage.

e Industrial Site

The industrial site adjacent to the Armory area is bounded on he west by Tremont Street, on the north by Harvard Street, on the ast by Westminster Street and on the south by Dunlap Street.

nother map entitled "Dorchester Boston" prepared by the Transportation ivision of the Boston Redevelopment Authority and dated December 961 indicates that the proposed Inner Belt which is an extension f the present John F. Fitzgerald Expressway through the western ortion of the city may be located along the north boundary of this ndustrial site, adjacent to and south of Dunlap Street.

he Warwick Street Site

The Warwick Street site is about 710 feet in the east-west irection and about 530 feet in the north-south direction. The pposite side of Harvard Street on the north is designated as housing. The pposite side of Westminster Street on the east is designated as housing.

eview of Locations

We have reviewed the location of the various selected sites ith responsible potential developers and tenants and have horoughly discussed with them the advantages and disadvantages f the locations, physical layout of the sites, accessibility to hroughways, opportunity for expansion and the effect of industrial nstallations adjacent to housing areas.

The consensus of their opinion is that a concentration of ndustrial installations adjacent to the Fitzgerald Expressway and ompletely divorced from housing is a prime approach to the problem. ll agreed that the best solution would be to extend the area llocated to industry from Dover Street south as far as possible etween Harrison Avenue and the Fitzgerald Expressway, eliminating he smaller streets such as Bristol, Thayer and Randolph Streets. uch a solution would create an area of substantial size for evelopment to suit various tenants. Circulation through this area ould be correlated with the installations, off-street parking and ruck dock areas.

lexibility

The developer should be given every opportunity to meet the requirements of the tenant, to transfer title for sites without encumbrances and offer flexibility in financial arrangements. Buildings in the development could be erected by either the developer or site purchaser and could be either one story or multi-story building.

mercial Use. Corridor Plan

The westerly side of Harrison Avenue would be allocated to mercial installations, including some recreational facility h as a bowling establishment and possibly a motel. This mercial installation would serve as a buffer between the industrial a and the housing area to the west. Direct ingress and egress m the industrial area to the adjacent Fitzgerald Expressway which ld expedite truck delivery and shipping and would also minimize ck circulation throughout the housing area. Separating the dustrial area from the housing will reduce to a minimum the hazard children living in the housing area.

T III - TRANSPORTATION FACILITIES

blic Transportation Facilities

Excellent public transportation is provided to the South End m from any section of the City of Boston by the Metropolitan nsit Authority. The elevated rapid transit through Washington reet has stations in the South End at Northampton Street and also Dover Street. The Huntington Avenue Subway Rapid Transit which verses the South End in the west has eight stations adjacent the South End at Massachusetts Avenue (Northeastern Station). ses Town bus service is provided which connects with these stations. re is additional bus service through Tremont Street which runs rough the South End in a north-south direction. The majority of rsons who live in other sections of the City and are employed those proposed industrial establishments can be assumed to the public transportation system going to and from daily work.

fluence of New Housing and Restoration of Existing Buildings

The proximity of new housing units to be constructed under e current program of the Boston Redevelopment Authority together th their emphasis on restoration and repair of existing residential ildings in the South End will influence and encourage the developer industrial installations in the area. Leases will be more ily secured because potential lessees will recognize that spective employees will have the opportunity to live near their rk. Families living in the neighborhood will benefit from this portunity through reduced transportation costs and increased me for other activities - time and money that would be otherwise ent travelling to and from work.

2. Allowing [illegible] spaces = 3[illegible] spaces required per building.

3. Allowing one space for each 1,[illegible] square feet gross building area = 100 spaces required per building.

We believe that available mass transportation facilities will reduce the required number of parking spaces for a South End industrial installation by at least 20 per cent. If we allow one space for each 2,000 square feet of gross building area, each building will require 50 spaces. This is in the ratio of one space per 14 persons on the basis of a building population of 720 persons. In our judgement, the latter is the practicable criteria.

PART IV - TYPICAL OCCUPANTS OF PROPOSED INDUSTRIAL BUILDING AND THEIR REQUIREMENTS

Type of Prospective Occupants

The following list of prospective occupants has been arranged in groups in an attempt to classify certain types of tenants which would have similar utility requirements. It will be noted that many of the occupants are not necessarily manufacturers and that certain tenanted areas will be occupied as distribution centers, particularly by those tenants whose goods are in the majority, distributed in the metropolitan area and therefore would operate more economically from a location within easy distance of the downtown section. A partial list of prospective tenants for these installations is as follows:-

Needle Trade Manufacturers - Apparel, Drapery
Furniture Upholstery and Repair
Custom Footwear - Novelty Slippers
Leather Goods - Gloves, Billfolds, Novelties, Handbags, Findings
Office Machine Repair - Typewriters and other Business Machines - Rental - Drafting Room Equipment
Janitor's Supplies - Industrial Cleaning and Maintenance
Labeling Equipment - Labels
Linen Supply Service
Printing Jobbers - stationery supplies - Graphic Arts
Mailing - Advertising Services
Rubber Stamps - Marking Devices - Nameplates
Reproduction Services - Blueprinting - Photostat - Microfilm - Enlargement - Mimeographing
Vacuum Cleaning Equipment - Supplies - Parts - Repair

Distributors - Smallwares - Notions - Novelties
Displays - Decorations - Novelties - Moulding - Advertising - Exhibits
Jewelry - Optical - Supplies, Repairs, Findings
Musical Instrument Distributors - Repair - Service
Picture Framing - Mirrors and Framing - Custom Work
Electronics - Small Parts Manufacturing and Assembly
Electric Appliance Distributors - Electrical Supplies
Sound Equipment - Television - Communications Systems - Radio
Appliance Dealers - Washing Machines - Water Coolers, etc.
Sales Distribution - Service - Repair
Lighting Fixtures - Repair - Maintenance - Lamps - Shades
Plastic Products
Floor Covering Distributors - Floor Machine Rental - Repair - Service
Hospital Equipment Supply - Distributors - Laboratory Equipment Suppliers
Housewares - Distributors
Aluminum Storm Windows - Doors - Jalousies - Venetian Blinds - Window Shades
Pharmaceutical Supplies
Instrument Service - Repair - Distribution

Tenant Area Requirements

It is believed that individual areas varying of approximately 6,000 square feet with the opportunity for tenants to lease double, triple or quadruple areas on the same floor will offer good flexibility for the developer in securing leases.

A building with [illegible] bays deep on each side will provide 4 tenant spaces per [illegible] floor each. On the basis of area, a 20 by 20 foot bay [illegible].

Eight bays, per common plan, each spaced two bays wide by 4 bays deep, will provide 1,[illegible] square feet (20 by 110 feet) per tenant. Four bays wide by [illegible] in a building 4 bays deep by 7 bays long (110 by 140 feet, bay) 15,[illegible] square feet per floor. If the full length is needed, an expansion joint through the building would be required. The depth could be increased up to 5 bays, each bay additional increase each tenant space area 1,500 square feet.

Tenant Subdivision Requirements

Subdivision requirements of different tenants will vary for factory and office [illegible] will [illegible] known until the tenants are

secured. Factory subdivisions such as the ... roofing, stock room, tool cribs, etc., can be installed to meet the tenant's needs. The separating partitions can be removable, interchangeable stock units made of wire mesh in metal frame. Office subdivisions will also be installed to meet the tenant's requirements.

PART V - FINANCIAL, STRUCTURAL AND MECHANICAL CONSIDERATIONS

Suburban Lease Space

Existing space is available in suburban one story buildings for 1.00 per square foot per year, net, the tenant also paying for maintenance and taxes; space may be leased for $1.25 per square foot including heat, power and light. The properties have adequate loading platform and automobile parking space.

In-town Lease Space

Space is available in existing left buildings in the in-town ... area for $1.00 to $1.50 per square foot for first floor and $.50 to $2.00 per square foot for upper floors (including heat and light). The majority of in-town properties have small bay spacing, inadequate shipping facilities (freight elevators, loading platform and truck dock) and little or no automobile parking space.

Competitive Rental of Prototype Building

The prototype must be produced at a cost which will permit rental which is competitive with the above and yet offer adequate facilities that existing in-town properties lack. In our judgement, this rental should be in the vicinity of 1.25 per square foot.

Elevator Considerations

Extent of freight and passenger elevators to be provided must be determined. The number of passenger elevators required is determined by a traffic study of the building population above the ground floor. On the basis of a 4 story building with 25,000 square foot per floor (4 tenant spaces @ 6,250 square feet) each tenant space averaging 45 persons, 180 persons per floor, the building population above ground is 180 x 3 = 540 persons. The desirable passenger carrying capacity is 13 per cent of the population in 5 minutes, or 70 persons. A car with a capacity of 12 persons will carry 10 persons per normal trip. For 36 feet of travel (3 floors at 12 feet) and a speed of 200 feet per minute, the round trip time will be about 30 seconds. In five minutes, two cars will carry 75 persons and the waiting interval will be 40 seconds. This

is acceptable, therefore, two passenger elevators car capacity 12 persons, speed 200 feet per minute will be required. Each elevator will cost approximately $30,000.00 exclusive of the cost of the shafts.

If the number of stories were increased to 6, the car capacity would be increased to 16 and the speed increased to 300 feet per minute. Elevators for such requirements would be approximately $36,000.00.

No well defined formula exists for the selection of freight elevators for the buildings. The uses to which they may be subjected can vary over a wide range. For efficient service, each bank of tenant areas in a building up to 6 stories high should be equipped with a freight elevator. Four tenant areas per floor will require 4 elevators. Size and capacity of the cars is determined by evaluating freight traffic in terms of the number, size and weight of the pieces to be carried. Consideration must be given to the use of power trucks carrying palletized materials. These trucks weigh from 3,000 to 5,000 pounds. Pallets vary in width from 48 inches to 56 inches. For two pallet width loads the car width should be 10 feet. Car size should be 10 by 10 feet with minimum capacity of 8,000 pounds and minimum speed of 75 feet per minute. It should be designed for Class C loading so a one piece load of full car capacity can be accommodated. Each freight elevator will cost approximately $30,000 for a four story building; $35,000 for a six story building, each price exclusive of cost of the shaft.

Freight and passenger elevator service for a four story building having a total floor area of 100,000 square feet (25,000 square feet and four tenant spaces per floor) will represent an initial cost of approximately $180,000.00 - more than $7.00 per square foot for the building area and about $1.80 per square feet of floor area.

The same service for a six story building having a total floor area of 150,000 square feet (25,000 square feet and four tenant spaces per floor) will represent an initial cost of approximately $214,000.00 - about $8.60 per square foot for the building area and about $1.40 per square foot of floor area. This indicates a savings of approximately $.40 per square foot for a 6 story building.

A building 8 stories high will require an additional passenger elevator and an increase in the freight facility, so the economy of adding stories to distribute elevator costs ceases at six stories.

<u>Structural Foundation Condiserations</u>

Foundation costs for any site in the South End which is not on the original Washington Street peninsula will add about $1.00 per

ure [illegible] of [illegible] of the building.

The Boston Society of Civil Engineers, within a short established ding Law Zone for the Back Bay. [illegible] prepare the s, showing locations of the borings. A brief number of charts the South End area and indicate what might eventually thoroughly investigated at any specific site in the area prior the design of foundations for any structure. Since adjacent the Washington Street shaft and the Tunnel Station will probably l for caissons. Piles often in the South End will most likely ssive piles.

Borings to be taken for any proposed building will be located hin the building area. Until the building location is established do not believe that additional boring information is required.

A four story building having a bearing of 10 tons per sq. ft. s will develop a maximum foundation load in the vicinity of ten s. The boring reports will determine the most economical foundation system to be employed.

Consideration will undoubtedly be given to concrete beams, girders and ential development indicate that most buildings will not be constructed on speculation. They will be financed on the basis of ured tenant leases.

Analysis of Bay Section

Analysis of various bay spacing for different structural floor ems in terms of cubic and unit bay loads have to properly termine the most suitable and economical bearing values for the ytype building.

Systems considered with investigation are:-

(a) Concrete flat slab
(b) Concrete beams and slabs
(c) Concrete joists and beams
(d) Concrete grid systems
(e) Concrete slabs, fireproofed steel beams
(f) Precast, prestressed floor systems

Flat Slab Framing

Concrete flat slab buildings are ideally suited for industrial upancy. Inadvertent overloadings are distributed and absorbed e structure of this nature.

The Boston [illegible] specifies a minimum
r flat slab systems is not less than 1/3 the length of the
nel or less than 5 inches. Structural analysis conforming to
is criteria will demonstrate that a floor system designed to
ntain a live load of 150 pounds per square foot will cost very
ttle more than one designed for 75 pounds per square foot. Add-
g the additional cost to the potential slab thickness will provide
structure which will accommodate the 150 pound live loading.
e would place the structure in the intermediate manufacturing
tegory and therefore increase the flexibility for addition of a
reater number of prospective tenants. Foundation requirements
uld be increased but to a minor degree in the light of advantage
ined for the additional cost.

aiform Bay Spacing

Uniform bay spacing will allow employment of most economical
onstruction techniques and quick erection. Repetitive use of
orms and placement of reinforcing steel will reduce material and
abor costs in reinforced concrete construction. The irregular
haped and odd bay sizes will increase construction costs. The
quare bay will prove most economical for flat slab systems.

tructural Bearing Data

Drawing S-1 shows framing and load analysis for a typical bay
for six different structural systems considered worth investigation.
For comparison, we have included the two systems considered most
suitable for the prototype in our preliminary engineering cost
estimate as indicated in Part VIII. They are designed on Drawing
S-1 as Scheme #1, Concrete Flat Slab with Drop Panels and Scheme
#4, Two Way Grid Flat Slab. Total cost estimates for reinforcement,
concrete and formwork are given in the column at the right-hand side
of the drawing. Scheme #4 is $1.91 per square foot; scheme #1 is
$2.03 per square foot. The volume of concrete for the column and
its capital is the same for both systems. The volume of concrete
in the grid flat slab for a typical bay is 21 cubic yards, and for
the flat slab with drop panels is 23 cubic yards. The saving in
concrete for the grid flat slab will also be reflected as a saving
in foundation cost, due to the reduction of dead load; this is
indicated on drawing A-11 which shows the estimated number of piles
required at each column location for the above two systems and for
a four and six story building. Due to the magnitude of the column
loads and the nature of the soil in the area, we have based our
foundation analyses on the use of concrete filled steel shell piles
driven to refusal, with a load capacity of 105 tons per pile. We
believe the average length of the piles will be 30 feet at an

[illegible] pile.

__[illegible] Estimate Structural Data__

The preliminary engineering [illegible] various parts of [the] work.

(a) Pages 12 through [illegible] [illegible] cost summaries of [fo]ur and six story buildings for both flat slab with drop panels [an]d grid flat slab construction.

(b) Page [illegible] is a tabulated cost analysis of the four [bui]ldings. It gives a total cost for each building and the proporti[o]n of total cost attributable to the various parts of the work.

(c) The difference in cost between the flat slab and the grid [fl]at slab systems for a four or six story building, respectively [is] relatively small in the overall [illegible], but it is sufficient [to] recommend the use of the grid flat slab. The six story height [is] the most economical to build in terms of dollars per square foot [bui]lding cost.

(d) The cost analysis shows that buildings of this size and [co]nstruction may be built for about $[illegible] per square foot. [Ad]ditional stories beyond six stories will reflect an increase in [co]st per square foot because vertical transportation facilities [wou]ld have to be increased to properly serve the added building [po]pulation and area. Additional horizontal increments in length [of] the building will produce the same result, [illegible] by the cost [of] incorporating an expansion joint through the building.

__[Ext]erior Wall System Considerations__

Exterior wall systems considered in [illegible] analysis are:-

(a) Masonry units.

(b) Precast concrete panels which could be cast at the job [or] plant fabricated if proven economical. Panels can be given a [va]riety of face treatments for architectural appearance.

(c) Prefabricated, insulated panels in metal frames for [of]fice facades.

__[Ge]neral Utility Requirements__

Utility requirements of prospective tenants can vary to a

substantial delays. This requirement for a specific tenant will not be built the lease is signed. Requirements of any tenant area can change with the change of lessee.

Provisions for Variable Tenant Utility Requirements

Modification of processes can change utility requirements in any tenant area. Certain tenants require ventilation, air conditioning or humidification for their processes while adjacent tenants may have no use for them. Certain tenants will want air conditioning in their offices, others may not. Electric power requirements for different tenants will also vary a great deal.

The prototype will be designed as a practical means to provide for these variables. Standard utilities such as electric, gas, hot and cold water, sewer, heating and telephone/intercom will be provided to all tenant areas. Valves, plugged tees and "Y" branches will also be installed so additional connections can be made when required. A utility shaft through the building will be located in the manufacturing area with access panels in the walls from each tenanted area. Special utilities may be installed to meet specific requirements with little or no disruption to the building.

A similar but smaller shaft through the building will be located in the office area to accommodate ducts which want air conditioning.

A central [illegible] will be provided to each building with electric circuit breakers and switches and separate meters on the main bus on the floor. Each building should be designed to furnish its own boiler room but if several buildings were constructed simultaneously by the same developer, a single boiler room probably would serve the project.

If future steam [illegible] or its use proven economical, a central refrigeration service could be provided.

Maintenance costs can be established on each tenants' return line if it is desired to meter their consumption.

In order to retain flexibility, a partial basement under the office area for rental, a partial basement for mechanical utilities will be considered; large enough to service the building as mentioned, switch gear, transformer and electric rooms, a shop, toilet facilities, storage room and exit stairways. Two freight elevators will be provided from the first level.

...e Problems

Some savings in construction costs might be effected if the ...gher allowable unit stresses for concrete and high strength steel ...mitted by the American Concrete Institute and American Institute ... Steel Construction could be used for design instead of those permitted ...he building code of the City of Boston.

If locations of sites finally selected for industrial develop... ...t are not in conformance with the Boston zoning regulations, an ...peal for variance must be filed with the Zoning Board prior to an ...plication for a building permit.

...RT VI - GENERAL DESCRIPTION OF BUILDINGS AND FACILITIES

...sic Functions of Prototype Building

Four basic functions comprise the fundamental spaces required ... the operation of the majority of industrial enterprises. They ... administration, manufacturing, receiving and shipping. Since ...dustrial processes are many and varied, the design of a prototype ...dustrial installation will be tailored to afford maximum flexibility ... the greatest number of participating tenants. The building will ... designed with maximum bay spacing consistent with practical ...onomical engineering practice to eliminate columns as much as ...ssible.

...ndard and Special Utility Requirements

The usual standard utilities will be provided and provision ...de to accommodate the installation of special or additional ...ilities that may be required by certain tenants, all as previously ...scribed in Part V, Financial, Structural and Mechanical Consider...tions.

...actical Story Height

A practical story height for the prototype will be based on ...fficient height in the manufacturing area to allow for overhead ...stribution of utilities such as air handling duct systems, ...earance for lighting fixtures, unit heaters and drainage systems ...om the floor above. If we allow 2 feet 6 inches for these ...ilities and 1 foot for floor construction and 8 feet 6 inches clear ...ight, we arrive at a 12 feet story height. Ceilings are not ...rmally required in the manufacturing, shipping and receiving areas. ...ab soffits can be left exposed and painted. Overhead utilities, ...stalled in an orderly fashion, are not objectionable in appearance ...d are readily accessible maintenance or change.

Bay Spacing

The accompanying drawings A-1, A-2 and A-3 show the floor plans of a prototype building, indicating four tenant spaces per floor, each tenant space approximately 6,250 square feet in area. A four story building will provide 16 tenant spaces; 6 stories - 24 spaces. The building is designed with uniform, square, 28 by 28 feet bays, 8 bays per tenant area. The 28 foot spacing is structurally economical, and provides the minimum number of columns in each tenant area.

The 8 bay length of the building results in maximum building length per structure without requiring an expansion joint. The depth of the building could be increased up to 8 bays, offering 4 tenant areas up to 12,500 square feet per floor. We have delineated the prototype with the 4 bay depth because we believe that tenant areas in the vicinity of 6,000 feet will more readily be leased. A single tenant may lease one or more adjacent tenant areas.

Elevators

Each bank of tenant areas is equipped with a freight elevator with a 10 by 10 foot car platform with 5000 pounds capacity, class C loading, and speed of 75 feet per minute.

Each building will be equipped with 2 passenger elevators, each of 2000 pounds, 12 passenger capacity and a speed of 200 feet per minute.

Toilet Facilities

Separate toilet facilities will be provided for manufacturing and office personnel for each tenant area.

Separation of Office and Manufacturing Area

To serve as a sound lock and to afford maximum quiet in the office areas, a partition system throughout the length of the building will separate the manufacturing areas from the office areas. The corridor and offices occupy one bay of the building depth. The floor slab in this bay is designed to sustain a live load of 150 pounds per square foot.

Loading Platform

A continuous loading platform extends the entire length of the rear of the building at the ground floor level providing maximum

ability for locating [illegible] with [illegible] and [illegible] to meet
ase. All budget [illegible] to be made to the leasing
etters.

rtitions and Ceilings

Partitions enclosing corridors, restrooms, elevators, toilets
d the separating partitions between tenant areas are permanent
rtitions of concrete block. Partitions in the office areas
s movable steel modular, interchangeable units, installed to
et tenants' requirements. They may be erected and re-erected at
y time by building maintenance personnel to suit changing require-
nts. The 4 foot module is employed for office partitions and
operated acoustical ceiling system in the office areas. The floor
vering and the ceiling will be installed prior to installation
the movable office partitions.

ghting System

The lighting system used in the office area will be integrated
th the ceiling suspension system. It will consist of two continuous
ways into which lensed, fluorescent fixture units may
plugged. The fixture units will divide flush with the
iling. This system will offer the utmost lighting flexibility
meet requirements at any point. Lighting intensity may vary
om 40 to 240 foot candles in any portion of the office area.
ixtures and fillers (portions not containing lighting) may be relocated, or rearranged
any time without marring or discoloring the ceiling such as
ditionally required for additions or removal of partitions.
ighting intensity may be increased or reduced by any
mount for reception, filing or display, these areas can vary in
ze or be changed in configuration to meet the tenants' require-
nts.

rtical Ceiling Panels

The acoustical ceiling panels in the office area will be the
movable, drop-in type, supported on a tee suspension system,
lowing full access to the space above the ceiling for installation
alteration of utilities that may be required. A similar ceiling
stem will be installed in the main corridor except that lighting
xtures will be the semi-permanent type.

ffice Arrangement Schemes

Drawings A-5 and A-6 illustrate a few of the many office
rrangements obtainable, using movable partitions and the lighting
stem described above. Interchangeable closets and cabinets match
e movable partitions.

...nnections for Tenants' Public Use Elements

Story height for the building will be 12 feet. Lighting ...ture soffits will be 8 feet 6 inches above floor, allowing ...roximately 3 feet 6 inches above the finished to the slab ...fit above for distribution of utilities that may be required by ... tenant. Each tenant area has access to a utility shaft in the ...tory area. The shaft will contain standard utilities such as ..., hot and cold water and drainage with valves and "y" branches ...ay tenant can avail himself of them as may require. Access ...ls will also be provided to the shaft to accommodate special ...lity requirements such as air exhaust or conditioning systems. ...lity shafts will extend through the roof and terminate in a ...house in which fans or other equipment may be installed.

A portion of each building will contain a basement as shown on ...wing A-1. One skylight aperture will be carried down to this level.

A space is provided adjacent to the utility shaft in all ...nant office areas for an air conditioning unit which may be ...talled at the tenants' option.

...ufacturing Area Arrangement Alternates

Drawing A-10 illustrates a few of the many alternate arrange...ts for each floor in the factory areas. The lighting system in ... factory area will consist of 3 continuous metal-type pan bay, ...pended from the structural slab which will be left exposed and ...ted. Interchangeable fluorescent fixtures which may be plugged ...o these raceways, spaced as desired by the tenant to provide the ...hting intensity he requires for his operation, and to accommodate ...nging lighting needs. Additional utilities or display may occupy ...portion of the area as shown, if the tenant so desires. Partitions ...dividing factory areas such as receiving, stock room, tool crib, ..., are removable, interchangeable units of wire mesh in metal ...nel frames, installed to meet the tenants requirements. The ...ar height for the basement will be 10 feet except for the boiler ...m which will be 14 feet. There will be a crawl space under the ...ainder of the building, accessible from the basement.

...erior Architectural Treatment

Drawings A-4, A-5 and A-7 illustrate architectural treatment ... the exterior of the building. A simple, prefabricated, insulated

nel [illegible] is [illegible] [illegible] [illegible]. The [illegible]
ith is [illegible] and all ground [illegible] [illegible] [illegible]
sign of the office [illegible] and building [illegible]. Exterior front
panels will be porcelain enamel, [illegible] galvanized steel,
inated. Foral Core insulation to provide a "U" factor of not
re than .20. The windows will be steel, projected, [illegible] each
th vents arranged so cleaning may be accomplished from the inside.
ndows and panels will be set in steel, prefabricated steel frames.
ndows and frames will be galvanized, [illegible] and field painted.

Drawing A-6 illustrates a variation of the above system,
signed to provide opportunity for the erection of signs by
nants, yet preserve a dignified uniformity of architectural
eatment. For this scheme, a sign [illegible] would be provided in the
andrels above certain windows as indicated. Removable signs to
t the spandrel would be furnished and would be changed upon
ange of tenants. A minimum amount of [illegible] will be used on
is facade. Remainder of this wall, also the rear and end walls
the building will be face brick [illegible] concrete block
ck up, total wall thickness will be [illegible] inches. Interior face of
e concrete block will be left exposed and painted. Windows
the rear and end walls of the building will also be stock, steel
ojected, each with vents arranged for window cleaning from
side the building.

Interior walls of the main entrance lobby and vestibules will
ve a minimum of architectural treatment such as a combination of
xtured and faced concrete block.

Further description of the features of the prototype building
e included in PART VII - Outline Specifications.

RT VII

[illegible]

[illegible]

[illegible]

1. SCOPE OF THE WORKS. -

The project consists of a multi-story manufacturing plant to be ected in the South End Urban Renewal Area located within the City of Boston.

The building will be 3 or 4 stories in height, and will have a artial basement. There will be a roof over all but the remainder of the uilding area with access from the basement. The basement will contain a oiler Room, Transformer Vault, Electric Service Room, Building Maintenance, torage, and Custodians' Room.

Each typical floor will have 4 typical spaces consisting of Office and Manufacturing areas, toilet facilities, [illegible].

Freight elevator service is provided for each bank of tenant areas.

The building is served by [illegible] elevators. Elevator machines are located in Penthouses on the roof.

The building is [illegible] bays long and [illegible] bays wide, all bays 23' x 28'. A continuous loading platform with canopy extends the full length of the rear of the building, at the ground floor level.

I-2. PREPARATION OF SITE. -

This includes removal of all existing obstructions, all excavation and backfill, fill placement and compaction, installation of bituminous concrete roads and parking areas, concrete walks, loading and seeding and all related items to fully complete the work within the project limits.

BUILDING SPECIFICATIONS - [illegible]

3. FOUNDATIONS. -

The building is to be entirely supported on [illegible] filled steel shell piles, driven to refusal. Each pile to have a load capacity of 105 tons. Pile caps, grade beams, basement walls and floors are to be reinforced concrete.

4. FRAMING. -

The superstructure will be of reinforced concrete columns, gold flat slab floor and roof slabs with ribs, girders, reinforced concrete beams at stair, elevator and shaft openings three floors, and reinforced concrete parapets and spandrels.

5. MASONRY. -

Except for the insulated panels at the office facade, exterior walls of the superstructure are to be built, backed by concrete masonry back-up units. Where back-up is not reinforced concrete frame, the steel slabs and galvanized steel anchors will be used.

Limestone will be used for main entrance throughout and for trim on the office facade.

Permanent interior partitions will be of brick masonry units. Entrance stairs in main lobby are reinforced concrete with pre-cast terrazzo treads and risers.

Concrete floors in manufacturing areas, basement and loading platforms will be left exposed and receive a floor hardener treatment.

6. ROOFING AND FLASHING. -

In general, roofing will be 20 year, bonded built up roofing, applied over rigid insulation and vapor barrier. Base flashings will be built up, cap flashings will be copper.

[illegible] - [illegible]

roofs will have standard roof drains and [illegible]. Through wall flashing at exterior wall openings to be 5 ounce [illegible].

I-7. METAL WINDOWS. -

All windows will be intermittent [illegible], primed, steel, prepared to receive screens, ventilators as shown. Windows to be galvanized and bonderized, delivered with one shop coat of paint and be complete with hardware.

I-8. METAL CURTAINWALL. -

Curtainwalls to be 22 gauge, framed horizontal and vertical frames, welded construction, factory assembled. Panels approximately 1-3/4" thick, 18 gauge, galvanized, horizontal steel pan type with fiberglass insulation, and faced on the outside with 16 gauge galvanized sheet with gasket sealed edges, "U" factor not more than .27. Add units and back panel to be delivered with one shop coat of paint.

I-9. DAMPPROOFING, WATERPROOFING, CAULKING. -

Unless otherwise noted, all permanent walls will be damproofed with two coats of brush applied bituminous material on the exterior face up to finished grades.

All exterior openings in masonry walls to be perimeter caulked with plastic caulking compound.

Waterproofing to be installed where required to be metallic cement plaster type.

I-10. GLASS AND GLAZING. -

Glass for metal sash to be double strength "B" quality, set in glazing compound.

OUTLINE SPECIFICATIONS - SECTION I [illegible]

Aluminum entrances will be [illegible] with 1" thick plate glass.

I-11. MISCELLANEOUS IRON. -

This includes steel stairs, railings, shelves, lintels, metal thresholds, and guard angles.

Typical interior stairs will be pan type with gypsolite treads and landings and standard steel pipe rails. Stairs in main entrance lobby will have aluminum rails.

I-12. METAL DOORS AND FRAMES. -

Interior doors in permanent partitions will be 14 gauge, 1-3/4 inch thick hollow metal with 16 gauge pressed metal combination frame, jamb and trim.

I-13. METAL LATH AND PLASTER. -

Ceilings in toilet areas will be suspended metal channel, metal lath and three coat plaster, finish coat Keene cement.

I-14. ACOUSTICAL TILE. -

Ceilings in the office areas and main corridor will be removable 2' x 4' acoustical panels, 1" thick. Exposed face of panels to be perforated .01" thick steel, back panel to be solid of same thickness, edges to be mechanically locked. Sound absorbing element to be non-dusting fibrous glass. Finish to be baked white enamel. Panels to be supported on an exposed T grid system with same enamel finish, and shall provide complete access to the space above the ceiling.

Acoustical ceilings are to be co-ordinated with lighting systems.

doors to be 1-3/4" thick, complete with hardware. Doors shall be removable both sides for ready access to moving machinery.

I-21. MOVABLE WIRE MESH PARTITIONS, INTERCHANGEABLE TYPE -

To be steel, interchangeable, prefabricated, movable standard units which can be arranged in any desired configuration, height or metal, fabricated of 10 gauge steel wire woven into 1-1/2" diamond mesh securely clinched to cold rolled channel frames. Door and corner window panels as shown, all factory finished in baked enamel, and available with hardware. All partitions and parts to be 100% removable.

I-22. OVERHEAD DOORS. -

Doors from manufacturing areas to freight elevator vestibules are roll-up interlocking steel slat, chain operated.

Overhead doors to loading platforms are heavy duty, steel, sectional type with counterbalance torsion spring. Size shall be as indicated.

I-23. ELEVATORS. -

Each passenger elevator will be 3500 pound, 14 person capacity with speed of 200 feet per minute, 6'-6" wide x 11'-5" deep platform size, automatic leveling, push button duplex selective operation, with horizontally sliding doors. Elevator machines located directly over the hoistway in a penthouse.

Each freight elevator will be 5000 pound capacity, Class C industrial truck loading, speed of 75 feet per minute, 10'-0" x 20'-0" platform, automatic leveling, with manually operated bi-parting vertical sliding doors. Machines to be located directly over the shaftway in a penthouse.

OUTLINE SPECIFICATIONS - [illegible]

I-24. PAINTING. -

This includes the painting of all interior concrete masonry partitions, exposed interior surfaces of exterior concrete masonry walls, interior exposed concrete surfaces [illegible] floors, interior plaster ceilings, exterior and interior ferrous metal, except factory finished movable partitions.

SECTION XI

PLUMBING

XI-1 SCOPE. -

(a) Sanitary Drainage System:- Complete sanitary drainage system within the building, connecting to all fixtures, equipment, floors and vertical runs with tap-offs in shafts throughout the building for tenant use, extending and terminating the building main drains at a point ten feet outside the building.

(b) Storm Drainage System:- Complete storm drainage system in building for interior roof drains and vertical drains, connecting and terminating the building main drains at points 10 feet outside the building.

(c) Domestic Cold Water System:- Complete domestic cold water system within the building, connecting to all fixtures, equipment, and vertical runs with valved tap-offs in shafts provided for tenant use. The system shall begin ten feet outside the building having a meter pit inside and run horizontally in the basement area and until upward during where necessary.

(d) Domestic Hot Water System:- Complete domestic hot water system within the building; connecting to all fixtures, equipment, vertical risers with valved tap-offs in shafts provided and including steam run 140°F. hot water storage heaters in boiler room area. System shall include recirculating main with circulating pump. Mains shall be run through basement and crawl space areas.

(e) Gas Systems:- Complete gas piping system inside the building from the meter provided by the Boston Gas Company. The interior system shall include low pressure gas mains and risers, including risers with valved tap-offs in utility shafts.

All branches to gas fueling equipment and appliances will be valved.

(f) Sprinkler System:- A complete sprinkler system will be installed in the basement and boiler room areas only and shall be installed in accordance to the latest City of Boston Code and the National Fire Protection Association. Fire extinguishers will be installed throughout the building to NBFU standards.

II-2. INSTALLATION:-

Installation shall be in accordance with the latest applicable City of Boston and Commonwealth of Massachusetts Code.

II-3. MATERIALS. -

(a) Underground water service and interior piping above 4" size - cast iron cement lined bell and spigot class 150 water pipe with Class "D" cement lined fittings; joints to be made with rubber and lead.

(b) Interior water piping 4" and under - all hot, cold, recirculating water inside the building shall be type "L" copper tubing with cast brass fittings suitable for soldered joints. Joints shall be made with 95-5% tin-antimony solder.

(c) Gas Service - Standard weight iron pipe black steel pipe with screwed and/or welded joints.

(d) Soil, waste, vent and roof conductor piping- Extra heavy cast iron bell and spigot soil pipe and fittings. Joints made with oakum and lead. Vent piping 2" and smaller installed above ground may be galvanized standard weight steel pipe with cast iron fittings. Short waste branches to fixtures may be type "L" copper tubing or iron size brass or copper pipe with recessed drainage fittings.

(e) Sprinkler piping - Standard weight black iron steel pipe with malleable iron screwed fittings.

(f) Insulation - Pipe insulation shall be 1-1/2 inch molded fibrous glass low pressure insulation. Cold water and roof conductor lines shall have vapor barrier. Exposed piping shall have an additional 3 ounce canvas jacket. Hot water tanks shall be insulated with 1-1/2 inch thick 85% magnesia blocks with hard cement grat finish.

(g) Hot water storage heaters - Hot water storage tanks shall be constructed of steel with copper lining, built for 125-150 pounds working pressure in accordance with ASME and Massachusetts standard requirements. Tank shall be heated by steam with copper heating coils located inside the tank.

(h) Hot water circulating pump shall be automatic electric motor driven all bronze body of capacity required.

(i) Valves - Valves on water lines to be bronze or brass throughout with packing glands, stuffing boxes and nuts, solid wedge, screw or union bonnets, designed for 150 pound steam working pressure and shall have screwed ends except for sizes above 3 inches.

(j) Cleanouts shall be Boston Regulation pattern brass cleanouts installed at all points necessary to make all portions of the drainage system accessible for cleaning purposes.

(k) Plumbing Fixtures - Complete with trim, of the latest models of Crane Co., Kohler Co., or Eljer Co., wall hung whenever possible. Drinking fountains to be wall hung electric water coolers.

(l) Fire Extinguishers - Portable dry chemical fire extinguishers designed and built to NFPA requirements, 5lb. unit for type generally and CO_2 type in mechanical equipment spaces.

(m) Toilet accessories - Mirrors, soap dispensers, shelves, paper dispensers, etc., as required.

(n) Hose and roof drains - Fire hose hangers, with brass stretchers as required, brass, Bronze, Smith or equal. Fifteen (15) wall hydrants - non-freeze type - cast bronze.

OUTLINE SPECIFICATIONS

SECTION III

HEATING AND VENTILATING

III-1. SCOPE. -

The scope of the work, without limiting the generality thereof, consists of furnishing and installing complete and fully operative the following systems in the building:-

(a) General. - Each system incorporated in the building shall be designed to yield flexibility for diversified tenant requirements.

(b) Heating and ventilating systems in the manufacturing areas are included in this Section of the specifications and shall be done to suit tenant requirements.

(c) Boilers. - Low pressure (15 psig) steam generators complete with all appurtenances and piping for a total capacity of 5000 pounds per hour of steam in the boiler located in the basement of the building.

(d) Commercial steam. - If steam is available from a commercial source, at the option of the owner, a pressure reducing station 100/15 psig with all required piping shall be provided in the mechanical equipment room instead of the steam generators.

(e) Steam distribution. - Steam and condensate risers in the shafts of the manufacturing areas and office areas including horizontal mains from the boiler room to the shafts and complete with hangers, girder, anchors, and expansion loops or joints.

(f) Capped branch tees. - At each floor, capped branch tees shall be provided on the supply and return risers in the shafts of the manufacturing areas for future connection of piping serving each tenanted manufacturing area.

(g) Metered steam. - If steam for heating and in process is to be metered for each tenant, a condensate meter shall be provided at each tenanted manufacturing area.

(h) Office area heating. - Finned tube baseboard radiation with piping, traps, valves and all accessories for heating the office areas to 72°F. when outside temperature is 0°F.

(i) Ventilation. - Ventilation supply and exhaust ductwork in each shaft. Ductwork shall be designed to provide 0.5 CFM per square foot of area.

(j) Toilet Ventilation. - Complete exhaust ventilation system with roof fans, ductwork and registers to provide 12 air changes per hour.

(k) Insulation. - Pipe insulation as applicable for the service including valves, flanges, fittings and equipment.

III-2. MATERIALS. -

(a) Piping and Fittings. - Steam piping shall be Schedule 40 black steel with malleable iron screwed fittings for piping 2 inches and smaller and welding fittings for piping 2-1/2 inches and larger. Condensate return piping shall be standard weight wrought iron with malleable iron screwed fittings for pipe 2 inches and smaller and wrought iron welded fittings for pipe 2-1/2 inches and larger.

(b) Valves - Gate and Globe. - Low pressure steam valves 2 inches and smaller shall be 125 pound class, bronze, with non-rising stem, screwed ends for sizes up to 2 inches and 125 pounds, flanged ends, cast iron body, bronze trim, outside screw and yoke type for sizes 2-1/2 inches and larger.

(c) High pressure steam valves shall be same as for low pressure except they shall be 250 pound cast iron class.

(d) Check valves shall be horizontal swing type of materials specified in III-2 (a) and (b).

(e) Pressure Reducing Valves. - Shall be pilot operated 125 or 250 pound cast iron body with stainless steel trim as required for the service. Basket type strainers shall be provided in the inlet connection to each valve. Relief valves shall be provided in the down stream connection with discharge pipe to atmosphere.

(f) Traps. -

(1) Inverted bucket type for dumping high pressure steam lines and equipment.

(2) Float and thermostatic type for low pressure steam lines and equipment.

(3) Thermostatic traps in return connection of finned tube radiation.

(4) "Y" type strainers at inlet of each steam trap.

(g) Pressure gauges shall be Bourdon tube type and shall be provided at inlet and outlet of pressure reducing valves.

(h) Ductwork shall be galvanized steel of gauges in accordance with the latest edition of the "ASHRAE" Guide.

(i) Registers and grilles shall be of standard manufacturer of the sizes and capacities required.

(j) Fans shall be centrifugal roof type exhausters of size and capacity required, tested and rated in accordance with the AMCA and ASHRAE Codes. Fans shall be equipped with vibration eliminator bases and disconnect switch.

[illegible]

(k) [illegible]

ded at the [illegible]

(l) [illegible]

nk shall be [illegible]

(m) [illegible]

be baseboard type [illegible]

II-3. [illegible]

All piping [illegible]

stallation of [illegible]

iler room equipment, [illegible]

stems prior to [illegible]

II-4. [illegible]

th pushrod [illegible]

ea. The handle [illegible]

aft and heating [illegible]

ether.

[illegible]

SECTION IV

ELECTRICAL WORK

IV-1. GENERAL. -

(a) All electrical work shall be in accordance with the latest rules and regulations of the National Electrical Code, the Electrical Inspection Department of the City of Boston, the Local Fire Insurance Company, and the Massachusetts Department of Public Safety.

(b) The building owner will provide and install feeders for all secondary service equipment and feeders for all [illegible] for corridor, hallway and [illegible] emergency lighting, and for [illegible] panelboards.

(c) The responsible [illegible] feeders for lighting over and above the [illegible] used by the building owner and for [illegible] conditioning.

(d) The building owner will provide electric energy for all basement lighting and power, [illegible] and street lighting. This energy will be metered by meters in the electric room adjacent to the tenant area.

IV-2. SERVICE. -

(a) Electric service for the project will be from underground lines of the Boston Edison Company, at either 4160 or 13,200 volts, 3 phase, depending on the [illegible]. The transformers in each building to 110/208 volts, 3 phase, 4 wire.

(b) The Boston Edison Company will furnish and install the underground electric service to the building, charging the building owner for that portion of the installation from a point two feet inside the property line to the building. The Boston Edison Company will furnish and install required transformation and primary disconnects in a transformer vault provided by the building owner within the basement of the building.

(c) The Boston Edison Company will meter the electrical energy required by the building owner at a location in the electric room provided in the basement of the building. The Boston Edison Company will meter the electrical energy required by the respective tenants at the respective electric rooms adjacent to the tenant areas.

IV-3. SERVICE EQUIPMENT.

(a) In the electric room, in the building basement, adjacent to the transformer vault, there will be a main building service disconnect switch, a building owner's service distribution switchboard for building owner metering, a building main switchboard and main disconnect switches controlling the tenant feeders for the low voltage on the various tenant floors.

(b) In the electric rooms on the various tenant floors, there will be tenant service distribution switchboards for tenant metering and as required building distribution panels.

(c) Standby [illegible] in an adjacent electric room will be of the standard type, [illegible] capacity for the loads to be served.

(d) Uninterruptible power will be available for absolutely necessary [illegible] and uninterrupting capacity for the loads to be served.

(e) Metering facilities will be as required by the local being

rved.

.4. FEEDERS. -

(a) Feeders supplying building power panelboards in the tenant

ors, used for corridor, stairway and floor lighting, and feeders to the

evator machine rooms will be of adequate size for the

ads being served. These feeders will originate at the building owner's

nelboard in the basement electrical room.

(b) Tenant feeders to the electric meters in the various tenant

ors will be of adequate size for the loads

ing served. These feeders will originate at suitable disconnect switches in

e basement electrical room.

(c) In each building, there will be one building owner's panel-

oard feeder, one feeder for each tier of electric meters and two tenant feeders,

e for each tier of electric meters.

(5). PANELBOARDS. -

(a) All panelboards shall be of the bolt-on circuit breaker type

ith the number of branches and frame size as required by the

oads being served. All panelboards will have lugs only in the mains and will

ave 3 pole and solid neutral risers.

(b) Building power panelboards will be located in the various

lectric closets on each floor.

(c) Tenant panelboards will be located in the tenant manufacturing

reas.

IV-6. RECEPTACLES. -

(a) Convenience receptacles will be located throughout the tenants offices and manufacturing areas. Convenience receptacles shall be rated 15 ampere, 125 volt, single phase, grounded type, of specification grade.

(b) Power receptacles in tenant manufacturing areas will be the responsibility of the tenant.

IV-7. WALL SWITCHES. -

(a) Wall switches for control of room lighting will be 20 ampere, totally enclosed, specification grade, single, double, or 3-way as required. Switches shall be a. c. rated.

IV-8. MOTORS. -

(a) All motors shall be of adequate rating for the size and type of loads being served.

(b) Motors rated 1/2 horsepower and lower shall be suitable for operation on 120 volt, single phase.

(c) Motors rated 3/4 horsepower and larger shall be suitable for operation of 208 volts, three phase.

IV-9. FIXTURES. -

(a) Electric fixtures in the offices and manufacturing areas will be of the fluorescent type and shall employ the Gibson "Uni-Race" method of installation or an approved equal system. This system employs a basic "Uni-Race" assembly into which the fluorescent fixture units are installed with the electrical connection between the "Uni-Race" assembly and the fixture being made through a plug-in arrangement.

OUTLINE SPECIFICATIONS - SECTION 17 - ELECTRICAL WORK (Continued)

Illumination levels may be increased or decreased by adding or removing fixture units without disturbing the basic "Unit-Shell" assembly.

(b) Electric fixtures in the office area will be of the recessed commercial type with option of louver or lens diffusers.

(c) Electric fixtures in the manufacturing area will be of the pendant industrial type.

(d) Only sufficient fixtures to produce an illumination level of twenty foot candles will be installed under this basic contract. Additional fixtures required for higher levels of illumination will be the responsibility of the tenant.

(e) In the office area, there will be two rows of recessed fixtures. In the manufacturing area, there will be three rows of fixtures per bay.

(f) Electric fixtures for the washrooms and foyer will be of the recessed fluorescent type, individual units spaced to give an illumination level of 10 foot candles.

(g) Stairway and toilet room electrical fixtures shall be of the recessed incandescent type of voltage and wattage to produce an illumination level of 10 foot candles.

(h) Electric fixtures for the boiler and stores will be of the incandescent type with DM dome reflectors of adequate wattage to produce an illumination level sufficient for the type area being served.

(i) Exterior lighting will be of the incandescent type with dome reflectors.

OUTLINE SPECIFICATIONS - SECTION IV - [illegible]

(c) Luminaires shall produce an [illegible] distribution, shall be suitable for use with an H33-GL, rough service mercury lamp, and shall be similar and equal to General Electric Form 100.

(d) Lamp ballast shall be autotype for use with an H33-GL mercury lamp, will operate on a 240 volt, single phase circuit, and shall be located in the transformer base of the lighting standard.

(e) Street and area lighting circuits will be controlled by an astronomical time clock located in the basement electrical room.

IV-13. EMERGENCY LIGHTING. -

(a) Emergency lighting units will be located in the corridors and stairways to provide emergency lighting for these areas.

(b) Units will be of the individual 6 volt, nickel-cadmium battery type, with double heads mounted on each unit.

(c) Units will be mounted on wall brackets, located approximately seven feet above floor and will be permanently connected with flexible conduit to wall outlet.

IV-14. TELEPHONE. -

(a) Empty conduits with surface mounted cabinets in the electric rooms, will be installed for the future installation of telephone cable and equipment by the telephone company.

(b) A main terminal cabinet will be located in the basement electric room with one-two inch conduit from this cabinet to the terminal cabinets in each tier of tenant electric rooms.

[illegible] (continued)

(c) Main terminal cabinets will be 36" x 14" x 6". Terminal cabinets in the tenant elevator rooms will be 30" x 32" x 8". All cabinets will be provided with 1 1/2" plywood backboards.

(d) Each 4" conduit will be installed from the terminal cabinet in the tenant elevator room to telephone outlets in the tenant quarters.

II
NARY ENGINEERING COST ESTIMATES, PENNELL [illegible] - [illegible] FEASIBILITY STUDY -

scription	Unit	Quantity	Unit Cost	Eng. Cost Est.
TION OF SITE - EARTHWORK AND GRADE				
tion	C.Y.	[illegible]	[illegible]	$ 14,415.00
Surplus Material	C.Y.	[illegible]	.21	8,000.00
g Gravel	C.Y.	500	1.60	800.00
ed Gravel	C.Y.	10,571	2.10	22,050.00
lk Gravel	C.Y.	541	2.10	1,134.00
ous Parking Area	S.Y.	11,570	1.50	19,308.00
ous Roads	S.Y.	6,300	2.10	13,650.00
ous Loading Platform Ramp	S.Y.	5,000	2.10	10,500.00
	C.Y.	275	3.00	825.00
Fertilize and Seed	S.Y.	4,350	.70	2,905.00
or Storm Drain	L.S.			45,240.00
or Water	L.S.			10,620.00
or Sanitary	L.S.			5,700.00
or Gas Piping	L.S.			4,740.00
te Walks	S.F.	37,370	.30	11,205.00
Parking Lines	L.S.			300.00
		TOTAL (For 5 Buildings)		$ 171,992.00

$\frac{172,000}{5}$ = $34,400.00

	TOTAL For 1 Building		$ 34,400.00
		Say	$ 35,000.00

INARY ENGINEERING COST ESTIMATE [illegible]

(continued)

escription	Unit	Quantity	Unit Cost	Eng. Cost Est.
LAT SLAB (1/2 of 1 FLOOR)				
s	S.Y.	[illegible]	$ 55.00	$ 1,000.00
	C.Y.	[illegible]	70.00	1,600.00
lat Slab	C.Y.	[illegible]	55.00	21,200.00
rick	EA.	[illegible]	.20	5,400.00
crete Blocks	EA.	[illegible]	.30	7,800.00
crete Blocks	EA.	[illegible]	.70	2,100.00
n Wall	S.F.	[illegible]	5.00	6,000.00
	S.F.	[illegible]	3.00	2,400.00
	S.F.	1,250	1.20	1,500.00
. Risers	E.	[illegible]	45.00	1,800.00
. Landing	S.F.	[illegible]	5.00	400.00
Plaster Ceilings	S.Y.	[illegible]	8.00	800.00
ic Tile Ceilings	S.F.	[illegible]	.80	2,900.00
c Tile Walls	S.F.	[illegible]	1.70	2,200.00
c Tile Floors	S.F.	770	1.30	1,100.00
Doors & Frames	EA.	24	125.00	3,000.00
ead Doors	EA.	3	700.00	2,400.00
t Partitions	EA.	10	120.00	1,200.00
it Tile Flooring	S.F.	3,600	.70	2,500.00
ing	L.S.			4,000.00
are	L.S.			3,000.00
				$ 76,400.00
			Call	$ 76,500.00

76,500 x 2 = 153,000 per floor

RELIMINARY ENGINEERING COST ESTIMATE, PROJECT #73-02 - B.R.A. FEASIBILITY STUDY -

(continued)

Description	Unit	Quantity	Unit Cost	Eng. Cost Est.
ASEMENT				
ONCRETE:-				
Foundation Walls	C.Y.	350	$ 50.00	$ 17,500.00
Basement Floor	C.Y.	175	50.00	8,000.00
Columns & Piers	C.Y.	23	60.00	1,100.00
8" Concrete Block	S.F.	4,000	.90	4,300.00
Stairs, Risers	S.F.	36	45.00	1,500.00
Stairs, Landings	S.F.	64	6.00	400.00
Stairs to Boiler Room	L.S.			900.00
Single Doors & Frames	E.A.	6	125.00	700.00
Double Doors & Frames	E.A.	4	175.00	700.00
Painting	L.S.			1,000.00
Hardware	L.S.			900.00
				$ 37,400.00

LIMINARY ENGINEERING COST ESTIMATE, PROJECT #73952 - B.R.A. FEASIBILITY STUDY -

(continued)

Description	Unit	Quantity	Unit Cost	Eng. Cost Est.
F - GRID FLAT SLAB				
f Slab	C.Y.	430	$ 65.00	$ 31,200.00
ms	C.Y.	109	70.00	7,600.00
ppy Roof Slab	C.Y.	45	60.00	2,700.00
ding Platform	C.Y.	50	50.00	2,500.00
f Insulation	S.F.	25,500	.30	7,700.00
G Roofing	Sq.	269	32.00	8,600.00
per Gravel Stop	L.F.	1,354	1.50	2,000.00
thouses	L.S.			19,000.00
cellaneous Flashing	L.S.			500.00
				$ 81,800.00
CELLANEOUS ITEMS				
rance Doors	Pr.	4	$ 700.00	$ 2,800.00
estone	S.F.	1,450	5.50	8,000.00
by Stairs	RISER	6	80.00	501.00
by	L.S.			2,000.00
by Railing	L.S.			200.00
				$ 13,500.00

MARY ENGINEERING COS[illegible]

(continued)

Description	[illegible]	[illegible]	Unit Cost	Total Cost Basis
[illegible] - 4 STORY BUILDING				
dings	L.S.			$ 1,200.00
ng	L.S.			2,700.00
er Piping	L.S.			23,700.00
r Piping	L.S.			7,200.00
r Return Piping	L.S.			2,700.00
	L.S.			17,000.00
	L.S.			30,000.00
t	[illegible]			6,700.00
ies	L.S.			5,000.00
				$ 95,200.00
	[illegible]			2,581.00
				$ 94,350.00
	[illegible]			9,400.00
	[illegible]			$103,850.00
			Say	$100,000.00
	Scaldfiber [illegible]			$ 9,000.50

MARY ENGINEERING COST ESTIMATE, [illegible]

(continued)

Description	Unit	Quantity	Unit	Est. Cost Unit
3 - 6 STORY BUILDINGS				
ainage	L.S.			$ 40,000.00
ing	L.S.			9,000.00
ter Piping	L.S.			12,000.00
er Piping	L.S.			4,000.00
er Return Piping	L.S.			2,200.00
y & Vent	L.S.			12,000.00
s	L.S.			24,000.00
nt	L.S.			11,000.00
ries	L.S.			7,500.00
				$ 129,200.00
	[illegible]			11,920.00
				$ 130,120.00
	[illegible]			13,320.00
	[illegible]			$ 143,440.00
			Say	$ 145,000.00
	Sprinkler Pits			$ 40,000.00

(continued)

Description	Unit	Quantity	Unit Cost	Est. Cost $
PROTECTION AND SERVICES				
Y BUILDING:-				
kklers - Basement Only				
= 6500 s.f. / 100 s.f. per head	=	65 Heads		
eads per head				
= Say $3,000 incl. hydrants				$ 3,000.00
First aid standpipe with hose rack [illegible]				
units per floor and 2 in basement =				
= 18 @ $200.00 = $3,600.00				
Piping 2,000.00				
$5,600.00				$ 5,600.00
				$ 8,600.00
				$ 9,000.00
Y BUILDING:-				
= 161,600 s.f. / 100 s.f. per head	=	1,616 Heads		
Heads @ $25.00 per head =			Say	$ 40,000.00

[illegible] (continued)

[illegible]	[illegible]	[illegible]	[illegible]	Engr. Cost Est.

[illegible] AND VENTILATING - 4 STORY BUILDING

[illegible] HEATING SYSTEM

[illegible] INCLUDES:

[illegible]ply & Return Steam Risers for Offices [illegible]	$ 500.00
[illegible]ply & Exhaust Duct Risers for Offices [illegible]	3,510.00
[illegible]ply & Return Steam Risers for Manufacturing [illegible]	2,510.00
[illegible]ply & Return Duct Risers for Manufacturing [illegible]	3,000.00
[illegible]ensate Meters & Pressure Reducing [illegible]	1,300.00
[illegible]aust Ducts for Toilets [illegible]	3,300.00
[illegible]t Heaters & Piping for Forming [illegible]	32,200.00
[illegible]ed Radiation along Wall Perimeter [illegible]	20,000.00
[illegible]ler Room Equipment & Piping [illegible]	20,000.00
	$ 87,000.00

[illegible] MANUFACTURING AREAS VENTILATION

[illegible] INCLUDES:

[illegible] Handling Units, Drawn-Through [illegible]	$ 39,000.00
TOTAL FOR BUILDING	$126,000.00

[illegible] ENGINEERING (ST [illegible] - STEEL SHED -

(continued)

Description	[illegible]	[illegible]	[illegible]	Eng. Cost Est.
[illegible] AND VENTILATING - [illegible] BUILDING				
[illegible] HEATING SYSTEM				
INCLUDES:				
[illegible]pply & Return Steam Risers for Office Areas	-	L.S.		$ 500.00
[illegible]pply & Exhaust Duct Risers for Office Areas	-	L.S.		4,900.00
[illegible]pply & Return Steam Risers for Manufacturing Area	-	L.S.		4,900.00
[illegible]pply & Return Duct Risers for Manufacturing Area	-	L.S.		9,300.00
[illegible]ondensate Meters & Receiver & Piping	-	L.S.		9,800.00
[illegible]haust Ducts for Unit [illegible]	-	L.S.		4,300.00
[illegible]it Heaters & Piping for Make [illegible]	-	L.S.		38,000.00
[illegible]ined Radiation along the Perimeter of the Building	-	L.S.		29,000.00
[illegible]iler Room Equipment & Piping & Oil Storage Tank	-	L.S.		37,100.00
				$ 123,000.00
[illegible]NUFACTURING AREAS ONLY [illegible]				
INCLUDES:				
[illegible]r Handling Units, Ductwork & Diffusers	-	L.S.		$ 46,000.00
			TOTAL FOR BUILDING	$ 169,000.00

RY ENGINEERING COST ESTIMATE FOR ELECTRICAL WORK IN BUILDING
(continued)

Description	Unit	Unit Price	Eng. Cost Est.
WORK - 4 STORY BUILDING			
Room	L.S.		$ 7,705.00
om Feeder, etc.	L.S.		749.00
Panel & Feeder	L.S.		267.00
eeder tenant floors	L.S.		530.00
ighting - Corridors, Stairs,			
t	L.S.		7,030.00
	L.S.		4,116.00
eders	L.S.		12,234.00
ea Lighting by Owner			
ft. candles)	L.S.		44,928.00
			$ 84,590.00
		Say	$ 85,000.00
WORK - 6 STORY BUILDING			
Room	L.S.		$ 8,490.00
om Feeder, etc.	L.S.		749.00
Panel & Feeder	L.S.		267.00
eeder - Tenant Floors	L.S.		785.00
ighting-Corridors, Stairs, Basement - L.S.			9,493.00
	L.S.		4,469.00
eders	L.S.		23,697.00
ea Lighting by Owner (to 22 ft. candles) - L.S.			67,382.00
			$ 120,332.00
		Say	$ 120,000.00

Gibson fixtures, 2 tube and uni-vrac pl n office air conditioning.

LIMINARY ENGINEERING COST ESTIMATE, PROJECT #13962 - D.P.A. FEASIBILITY STUDY -

(continued)

Description	Unit	Quantity	Unit Cost	Eng. Cost Est.
SUMMARY - 4 STORY BUILDING - GRID FLAT SLAB				
ement				$ 37,400.00
loors @ $153,000.00				612,000.00
f, etc.				81,800.00
bellaneous Items				13,500.00
able Partitions				42,400.00
vators:-				
Freight - $120,000.00				
Pass. - 60,000.00				
$180,000.00				180,000.00
e Foundations				146,400.00
e Work				35,000.00
mbing				104,000.00
e Protection - Sprinkler				9,000.00
ctric				85,000.00
ting & Ventilation				116,000.00
			- E & M COST OF BLDG.	$1,472,500.00
			Cell	$1,473,000.00

A OF BUILDING

25,[illegible]

4 floors

,800
,500 (Basement)
900 Loading Platform
,200 s.f. total.

$1,473,000.00 / [illegible] = $13.26 per s. f.

MARY ENGINEERING COST ESTIMATE, PROJECT #1.1 - B.P.A. FEASIBILITY STUDY -

(continued)

Description	Unit	Quantity	Unit Cost	Eng. Cost Est.
MARY - 6 STORY BUILDING - GRID FLAT SLAB				
				$ 37,400.00
s @ $153,000.00				918,000.00
tc.				81,300.00
aneous Items				13,500.00
Partitions				63,600.00
s:				
ght - $140,000.00				
s. - 72,000.00 / $212,000.00				212,000.00
undations				195,200.00
k				35,000.00
G				145,000.00
tection & Sprinklers				40,000.00
				120,000.00
& Ventilating				169,000.00
		TOTAL COST OF BUILDING		$2,030,500.00
			Call	$2,031,000.00

BUILDING:-

y Building 110,200 s.f.
2 floors
5,700 s.f. = 51,400 / 161,600 s.f.

$\frac{\$2,031,000.00}{161,600 \text{ s.f.}} = \$12.56$ per s.f.

ARY ENGINEERING COST ESTIMATE, [illegible] - B.P. "[illegible] STUDY -

(continued)

cription	Unit	Quantity	Unit Price	Eng. Dept. Est.
MARY - 4 STORY BUILDING - FLAT SLAB FOR LIVE LOADS				
				$ 37,400.00
@ $156,500.00				126,000.00
c.				32,340.00
neous Items				10,370.00
Partitions				42,400.00
s				130,000.00
ndations				157,600.00
k				35,000.00
s				104,000.00
tection & Sprinkler				9,300.00
				85,000.00
				116,000.00
			[illegible] BUILDING	$1,488,740.00
			Call	$1,489,000.00

$\frac{\$1,488,000.00}{111,200 \text{ s.f.}}$ = $13.51 per s.f.

NARY ESTIMATE (COST ESTIMATE [illegible] ESTIMATED ST[illegible]

(continued)

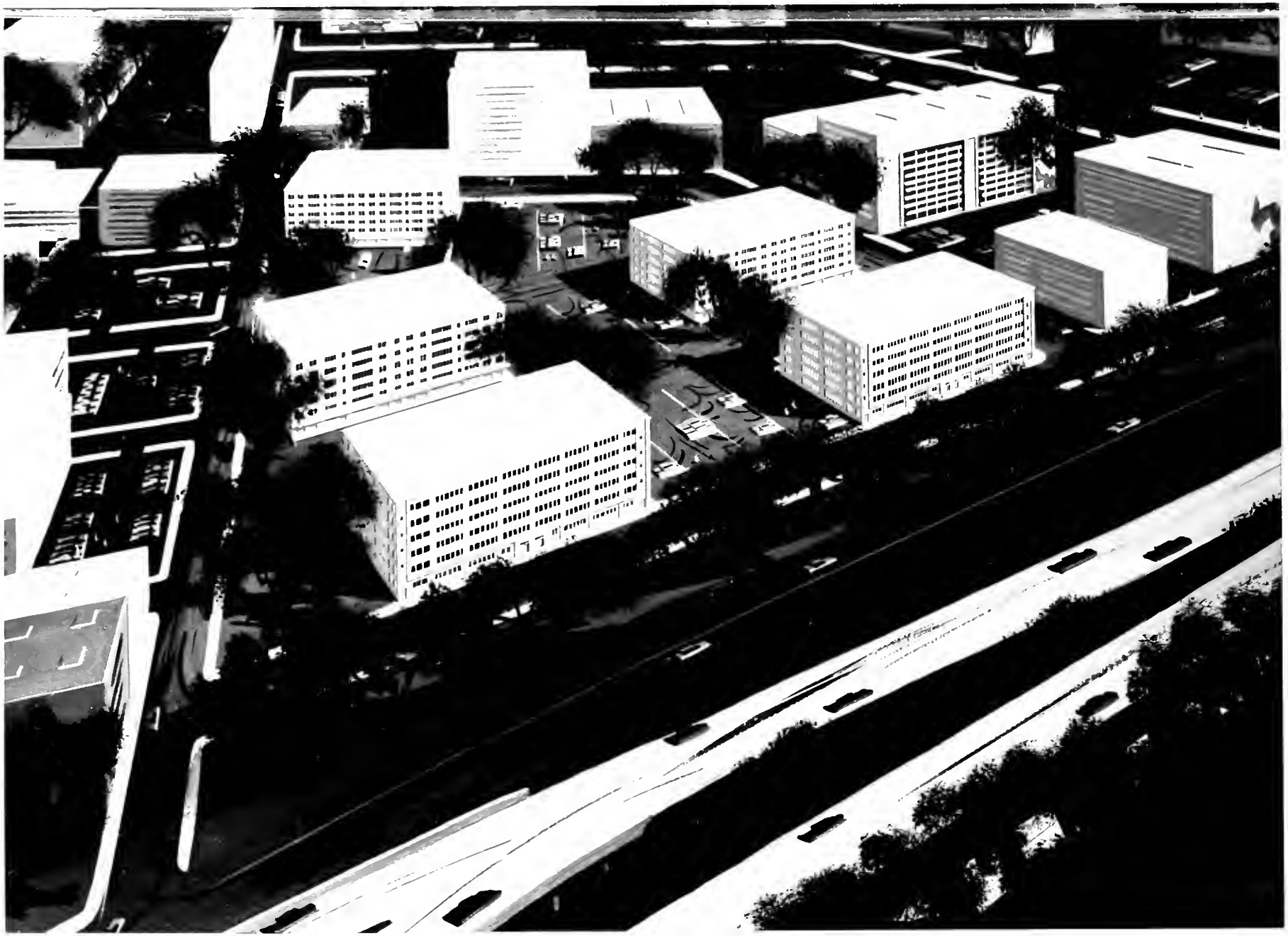
Description	Unit	Quantity	Unit Cost	Bldg. Cost
MMARY - 6 STORY BUILDING - [illegible]				
t				$ 31[illegible]
s @ $156,500.00				939,000.00
tc.				11,340.00
aneous Items				13,500.00
Partitions				63,600.00
rs				216,000.00
undations				108,000.00
rk				35,000.00
g				145,000.00
rotection & Sprinklers				70,000.00
.c				120,000.00
g				169,000.00
			[illegible] BUILDING	$ 2,065,340.00
			Total	$ 2,066,000.00

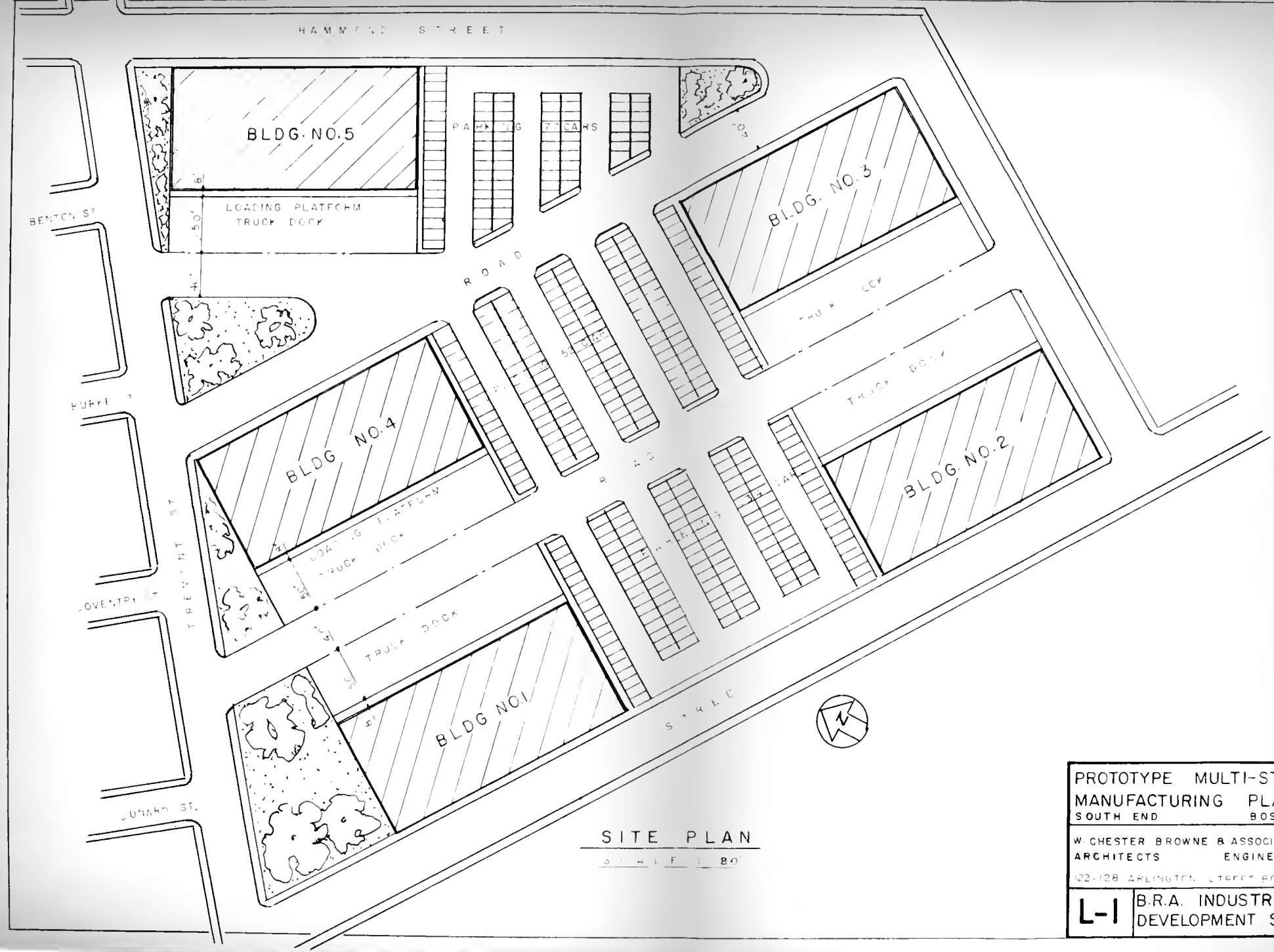
[illegible]

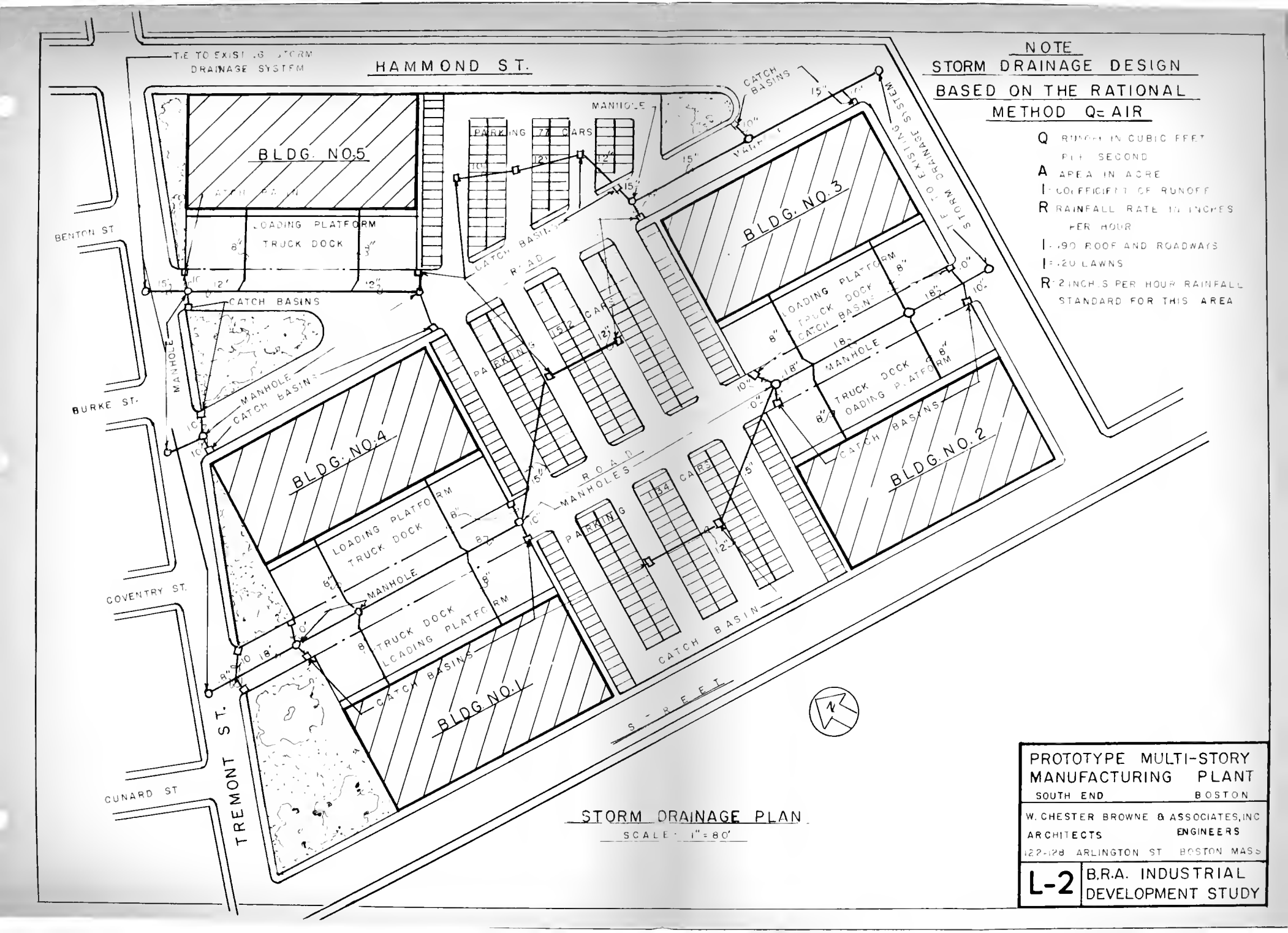
IMINARY ENGINEERING COST ESTIMATE, PROJECT NO. 73962 - B.R.A. FEASIBILITY STUDY

ANALYSIS SHOWING PROPORTION OF TOTAL BUILDING COST ATTRIBUTABLE TO ELEVATORS, FOUNDATIONS, SITE WORK, PLUMBING, FIRE PROTECTION AND SPRINKLERS, ELECTRIC, ING

	4 STORY FLAT SLAB	4 STORY GRID FLAT SLAB	6 STORY FLAT SLAB	6 STORY GRID FLAT SLAB
AL COST	$1,489,000.	$1,473,000.	$2,056,000.	$2,031,000.
PER SQ. FT.	$ 13.51	$ 13.35	$ 12.78	$ 12.56
)COST	$ 180,000.	$ 180,000.	$ 212,000.	$ 212,000.
)% of TOT.COST	12.1%	12.2%	10.3%	10.4%
)COST/S.F.OF BLDG.	1.63	1.63	1.31	1.31
)COST	$ 157,600.	$ 146,400.	$ 208,000.	$ 195,200.
NS)% of TOT.COST	10.5%	10.0%	10.1%	9.6%
)COST/S.F.OF BLDG.	1.43	1.33	1.29	1.21
K)COST	$ 35,000.	$ 35,000.	$ 35,000.	$ 35,000.
)% of TOT. COST	2.35%	2.38%	1.69%	1.73%
)COST/S.F.OF BLDG.	.32	.32	.22	.22
)COST	$ 104,000.	$ 104,000.	$ 145,000.	$ 145,000.
)% of TOT.COST	7.0%	7.1%	7.0%	7.1%
)COST/S.F.OF BLDG.	.94	.94	.90	.90
)COST	$ 9,000.	$ 9,000.	$ 40,000.	$ 40,000.
G)% of TOT.COST	.6%	.6%	1.9%	2.0%
RS)COST/S.F.OF BLDG.	.08	.08	.25	.25
)COST	$ 85,000.	$ 85,000.	$ 120,000.	$ 120,000.
)% of TOT.COST	5.7%	5.8%	5.8%	5.8%
)COST/S.F.OF BLDG.	.77	.77	.75	.75
)COST	$ 116,000.	$ 116,000.	$ 169,000.	$ 169,000.
)% of TOT.COST	7.8%	7.9%	8.2%	8.3%
)COST/S.F.OF BLDG.	1.05	1.05	1.05	1.05




HAMMOND STREET
BLDG. NO.5
LOADING PLATFORM
TRUCK DOCK
PARKING 77 CARS
BLDG. NO.3
TRUCK DOCK
BLDG. NO.4
LOADING PLATFORM
TRUCK DOCK
BLDG. NO.2
TRUCK DOCK
BLDG NO.1
BENTON ST
TREMONT ST
COVENTRY ST
LUNARD ST.
ROAD
STABLE
50'
40'
SITE PLAN
SCALE : 80'
PROTOTYPE MULTI-STORY MANUFACTURING PLANT
SOUTH END BOSTON
W. CHESTER BROWNE & ASSOCIATES, INC
ARCHITECTS ENGINEERS
122-128 ARLINGTON STREET BOSTON
L-1
B.R.A. INDUSTRIAL DEVELOPMENT STUDY



NOTE

STORM DRAINAGE DESIGN BASED ON THE RATIONAL METHOD Q= AIR

Q RUNOFF IN CUBIC FEET PER SECOND

A AREA IN ACRE

I = COEFFICIENT OF RUNOFF

R RAINFALL RATE IN INCHES PER HOUR

I = .90 ROOF AND ROADWAYS

I = .20 LAWNS

R = 2 INCHES PER HOUR RAINFALL STANDARD FOR THIS AREA

STORM DRAINAGE PLAN

SCALE: 1" = 80'

PROTOTYPE MULTI-STORY MANUFACTURING PLANT

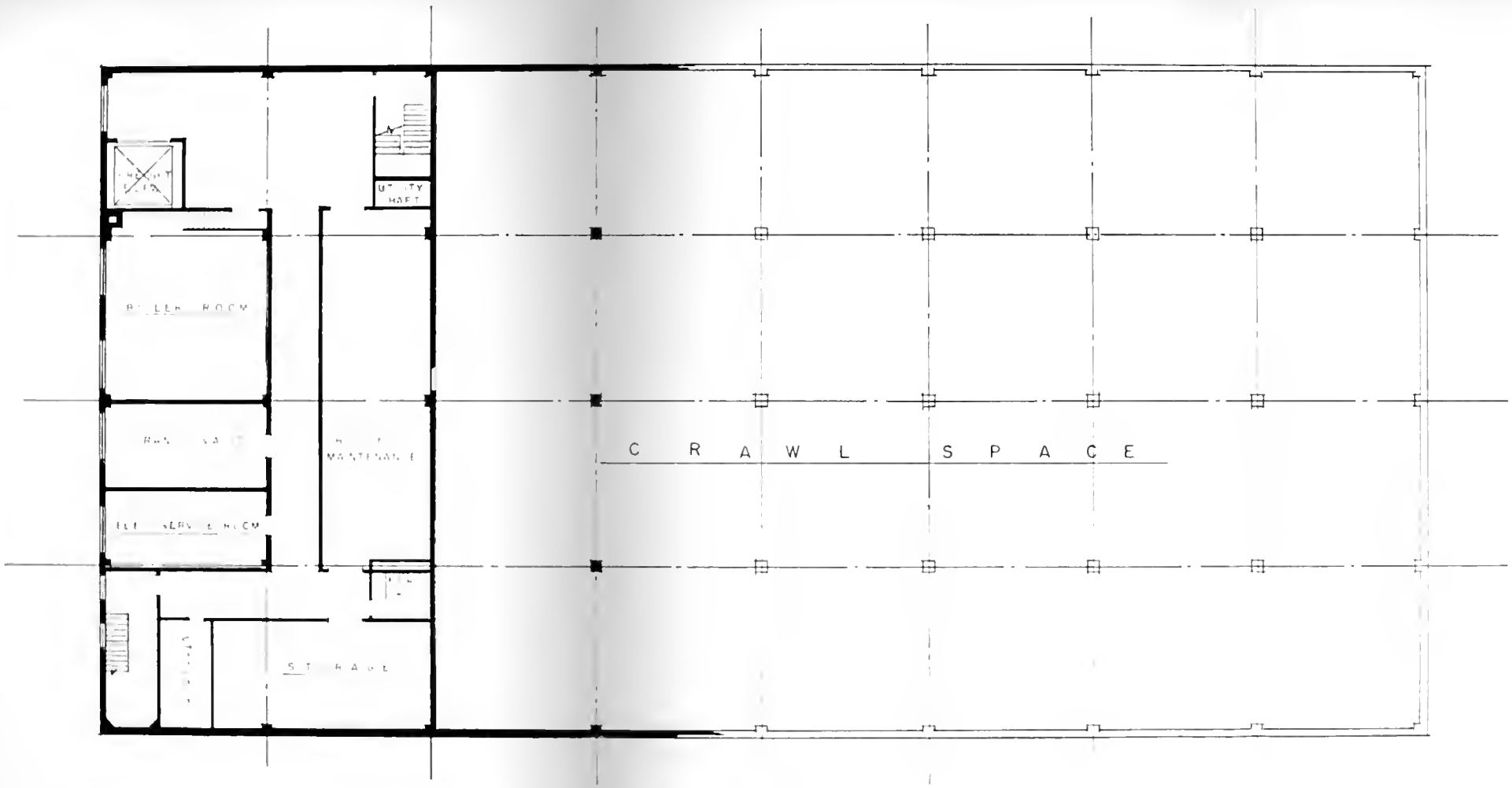
SOUTH END BOSTON

W. CHESTER BROWNE & ASSOCIATES, INC

ARCHITECTS ENGINEERS

122-128 ARLINGTON ST BOSTON MASS

L-2 B.R.A. INDUSTRIAL DEVELOPMENT STUDY



SCHEME "A"

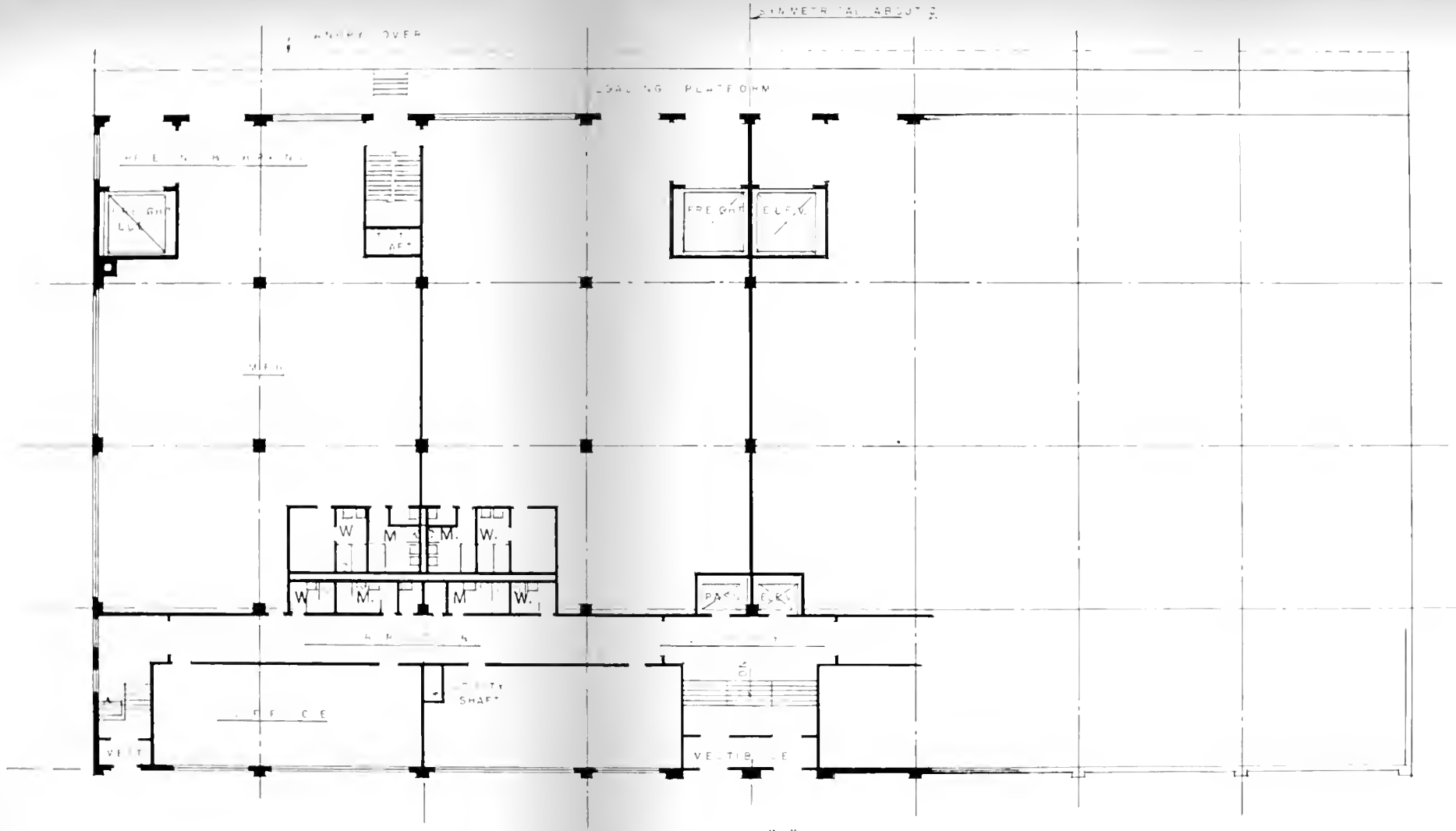
BASEMENT PLAN

SCALE 1/16 1 0

PROTOTYPE MULTI-STORY MANUFACTURING PLANT
SOUTH END BOSTON

W CHESTER BROWNE & ASSOCIATES, INC.
ARCHITECTS ENGINEERS
[illegible] BOSTON MASS.

A-1 | B.R.A. INDUSTRIAL DEVELOPMENT STUDY



SCHEME "A"

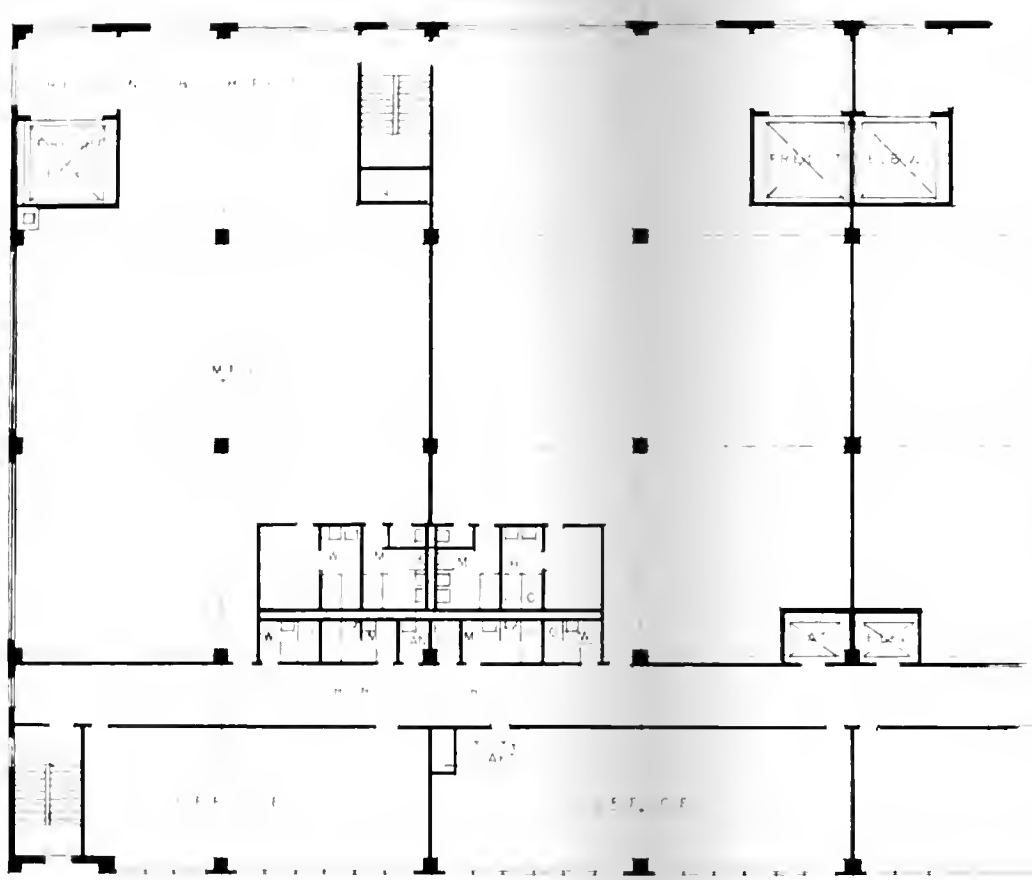
GROUND FLOOR PLAN

SCALE: 1/8" = 1'-0"

PROTOTYPE MULTI-STORY MANUFACTURING PLANT
BOSTON

W. CHESTER BROWNE & ASSOCIATES, INC.
ARCHITECTS ENGINEERS

A-2 | BRA INDUSTRIAL DEVELOPMENT STUDY



SCHEME "A"

TYPICAL FLOOR PLAN

PROTOTYPE MULTI-STORY MANUFACTURING PLANT

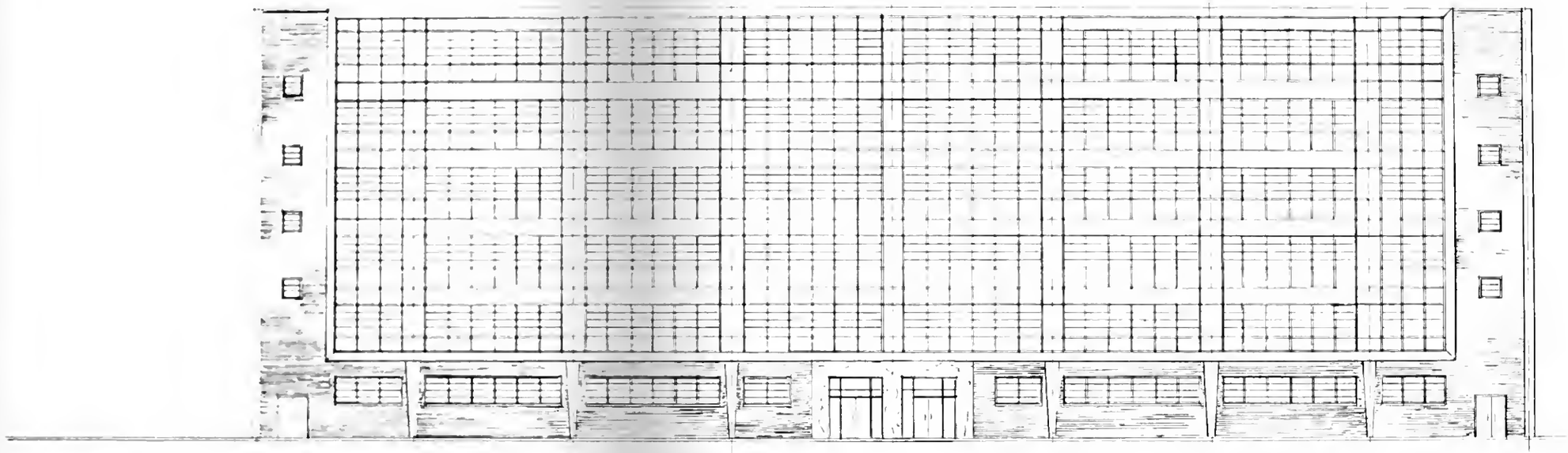
BOSTON

WORCHESTER BROWNE & ASSOCIATES, INC.

ARCHITECTS ENGINEERS

BOSTON

A-3 | B.R.A. INDUSTRIAL DEVELOPMENT STUDY



SCHEME "A" & "B"

FRONT ELEVATION

SCALE: 1/16" = 1'-0"

(6 STORIES)

PROTOTYPE MULTI-STORY MANUFACTURING PLANT

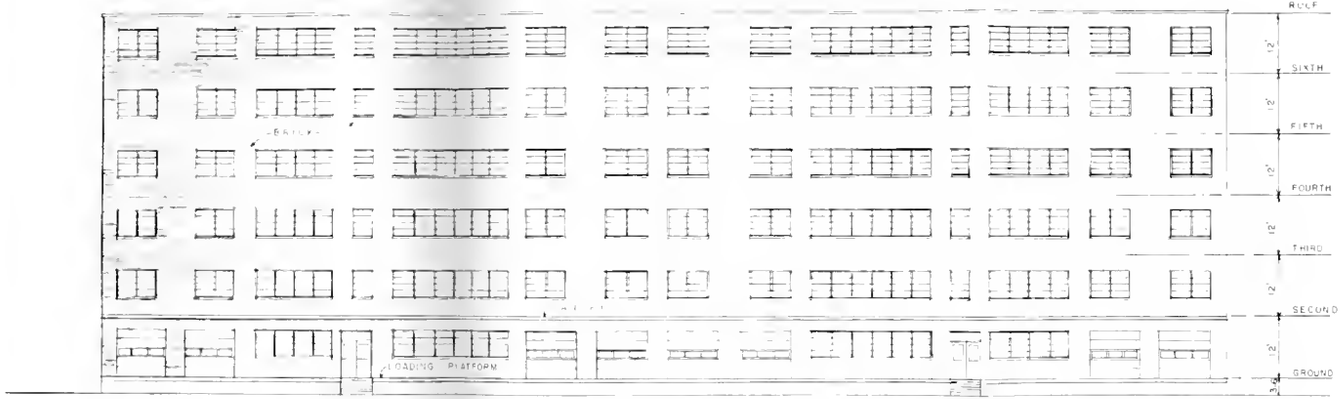
SOUTH END BOSTON

W. CHESTER BROWNE & ASSOCIATES, INC.

ARCHITECTS ENGINEERS

122-128 ARLINGTON ST. BOSTON

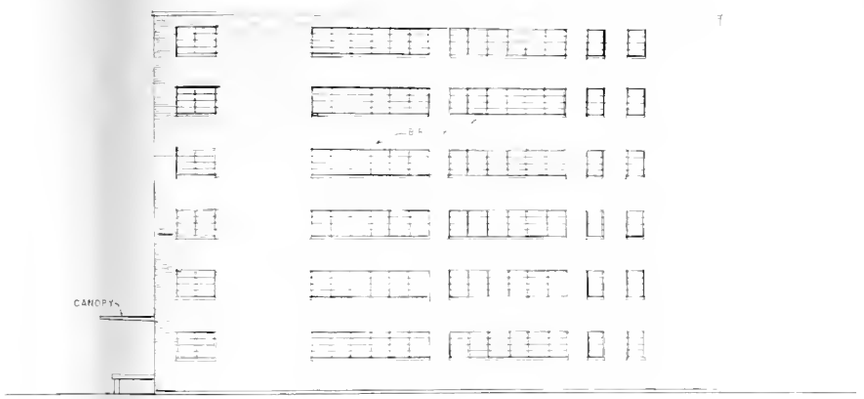
A-4 B.R.A. INDUSTRIAL DEVELOPMENT STUDY



REAR ELEVATION

SCALE 1/8" = 1'-0"

SCHEME "A"



SIDE ELEVATION

SCALE 1/8" = 1'-0"

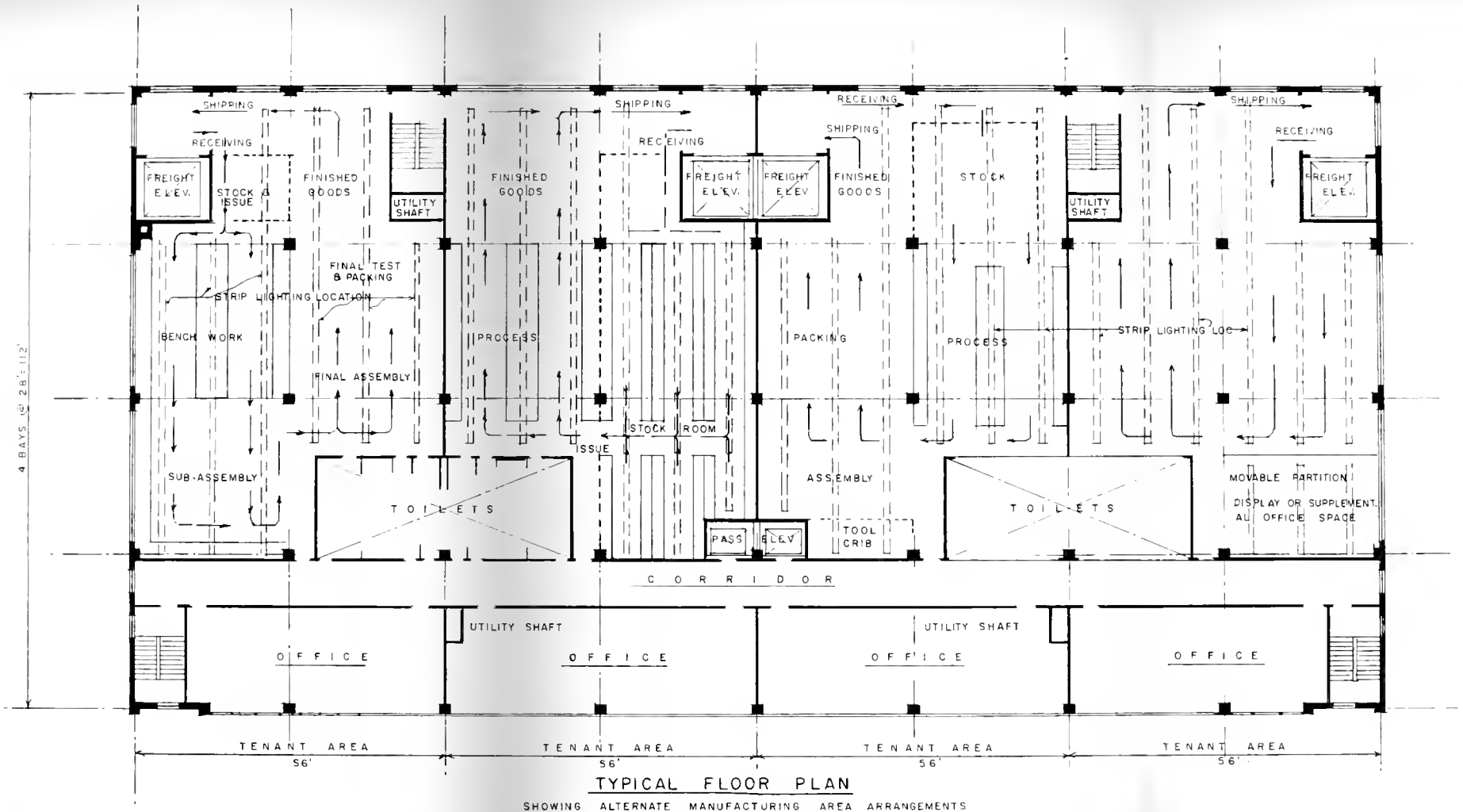
PROTOTYPE MULTI-STORY MANUFACTURING PLANT

H. EYE BOSTON

ENGINEERS

BOSTON

A-5 BRA INDUSTRIAL DEVELOPMENT STUDY



TYPICAL FLOOR PLAN

SHOWING ALTERNATE MANUFACTURING AREA ARRANGEMENTS

SCALE. 1/8"=1'-0

ARROWS INDICATE WORK FLOW

MOVABLE WIRE MESH PARTITIONS SHOWN THUS - - - - - -

PROTOTYPE MULTI-STORY MANUFACTURING PLANT

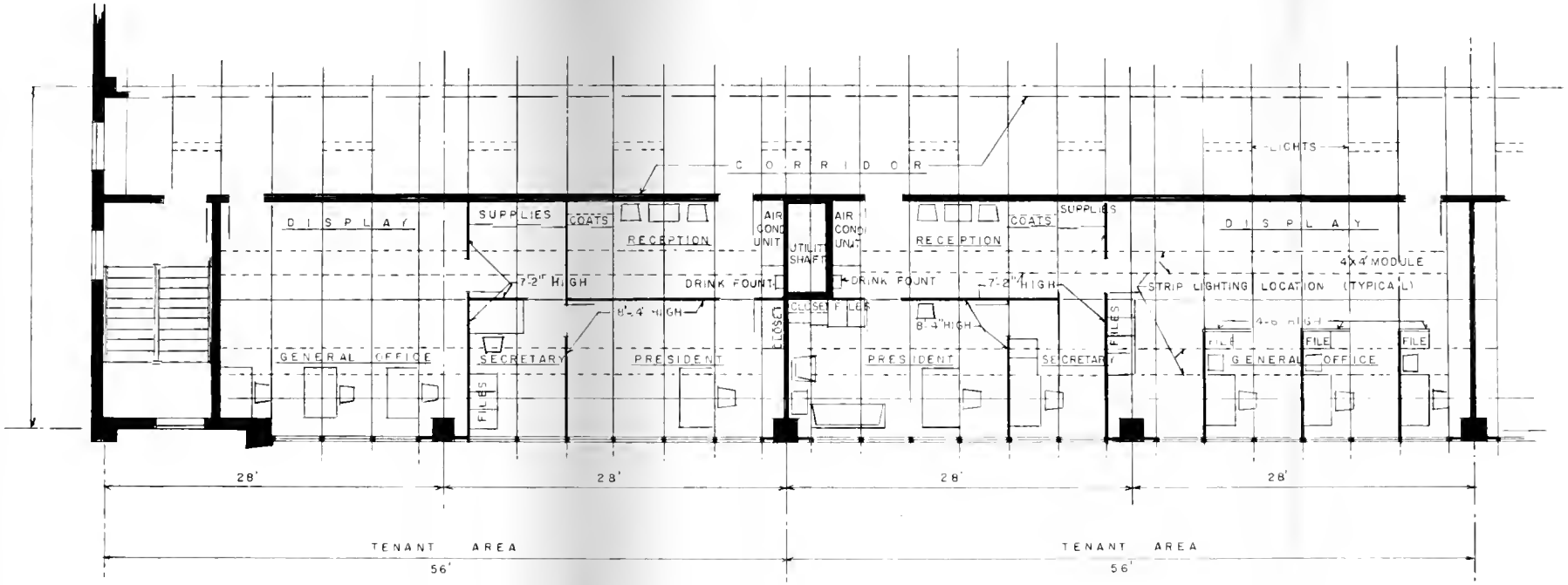
SOUTH END BOSTON

W CHESTER BROWNE & ASSOCIATES, INC.

ARCHITECTS ENGINEERS

122-128 ARLINGTON ST BOSTON

A-6 B.R.A. INDUSTRIAL DEVELOPMENT STUDY



PROPOSED OFFICE ARRANGEMENT

SCALE : 1/8"= 1'-0"

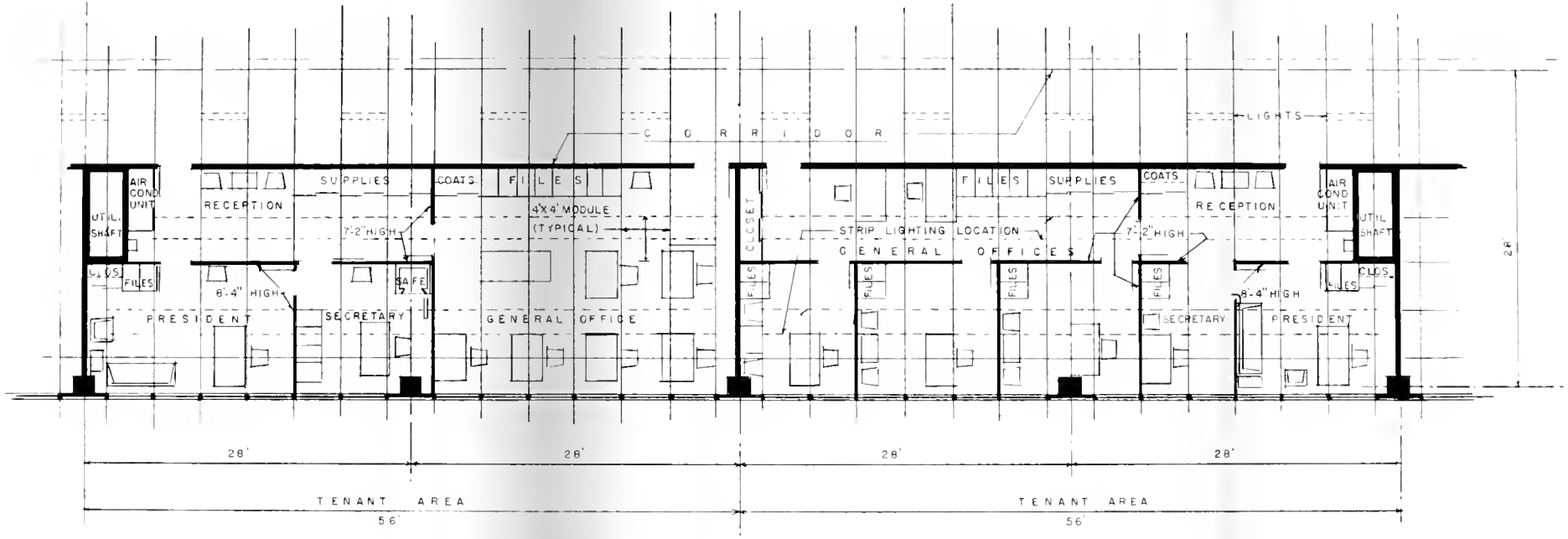
PERMANENT PARTITIONS SHOWN SOLID — ALL OTHERS MOVABLE

CEILINGS IN CORRIDOR & OFFICE AREAS ARE 8'4" HIGH, SUSPENDED, REMOVABLE ACOUSTICAL PANELS

PROTOTYPE MULTI-STORY MANUFACTURING PLANT
SOUTH END BOSTON

W. CHESTER BROWNE & ASSOCIATES, INC
ARCHITECTS ENGINEERS
22-128 ARLINGTON ST. BOSTON

A-7 | B.R.A INDUSTRIAL DEVELOPMENT STUDY



ALTERNATE OFFICE ARRANGEMENT

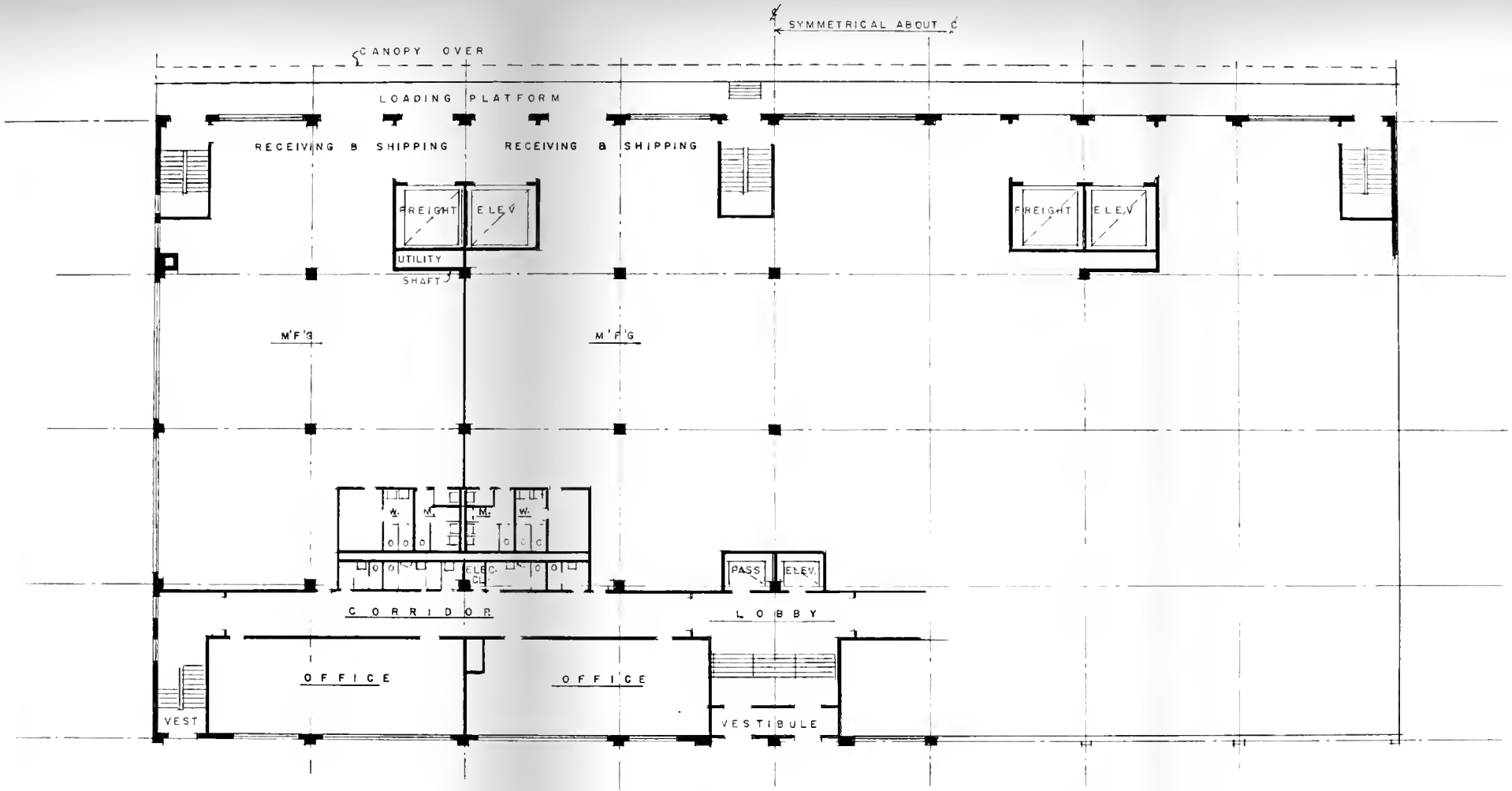
SCALE: 1/8"=1'-0"

PERMANENT PARTITIONS SHOWN SOLID - ALL OTHERS MOVABLE
CEILINGS IN CORRIDOR & OFFICE AREAS AT 8'-4" HIGH, SUSPENDED, REMOVABLE ACOUSTICAL PANELS.

PROTOTYPE MULTI-STORY MANUFACTURING PLANT
FORTH END BOSTON

W. CHESTER BROWNE & ASSOCIATES INC.
ARCHITECTS ENGINEERS
122-128 ARLINGTON ST. BOSTON

A-8 | B.R.A. INDUSTRIAL DEVELOPMENT STUDY



SCHEME-"B"

GROUND FLOOR PLAN

SCALE 1/16"=1'-0"

NOTE

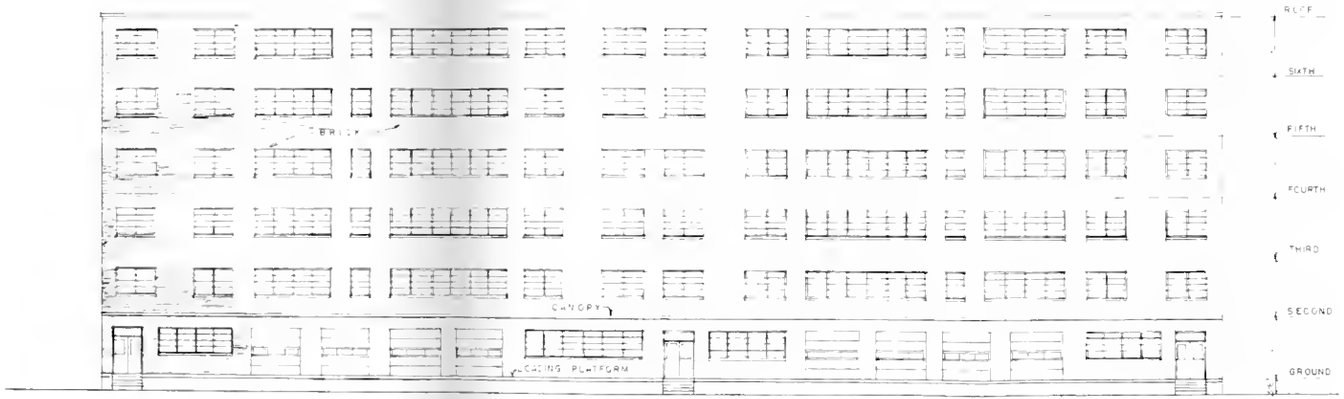
TYPICAL FLOOR PLAN FOR SCHEME "B"
SIMILAR TO SCHEME "A" FLOOR PLAN

PROTOTYPE MULTI-STORY MANUFACTURING PLANT
SOUTH END BOSTON

W. CHESTER BROWNE & ASSOCIATES, INC
ARCHITECTS ENGINEERS
122-128 ARLINGTON ST BOSTON

A-9

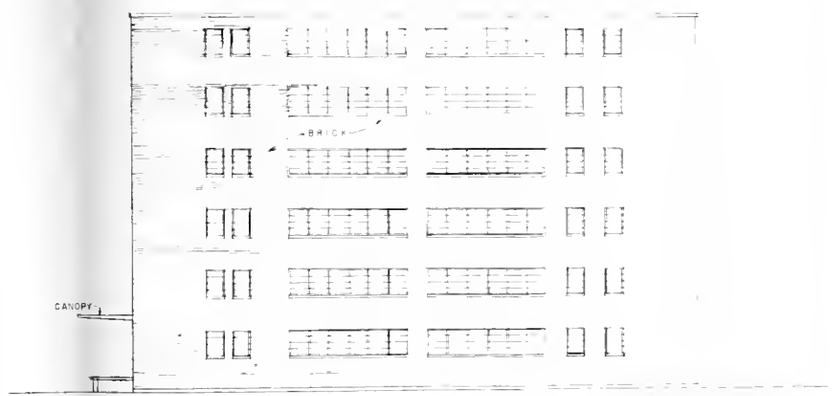
B.R.A. INDUSTRIAL DEVELOPMENT STUDY



REAR ELEVATION

SCALE 1/16"=1'-0"

SCHEME "B"



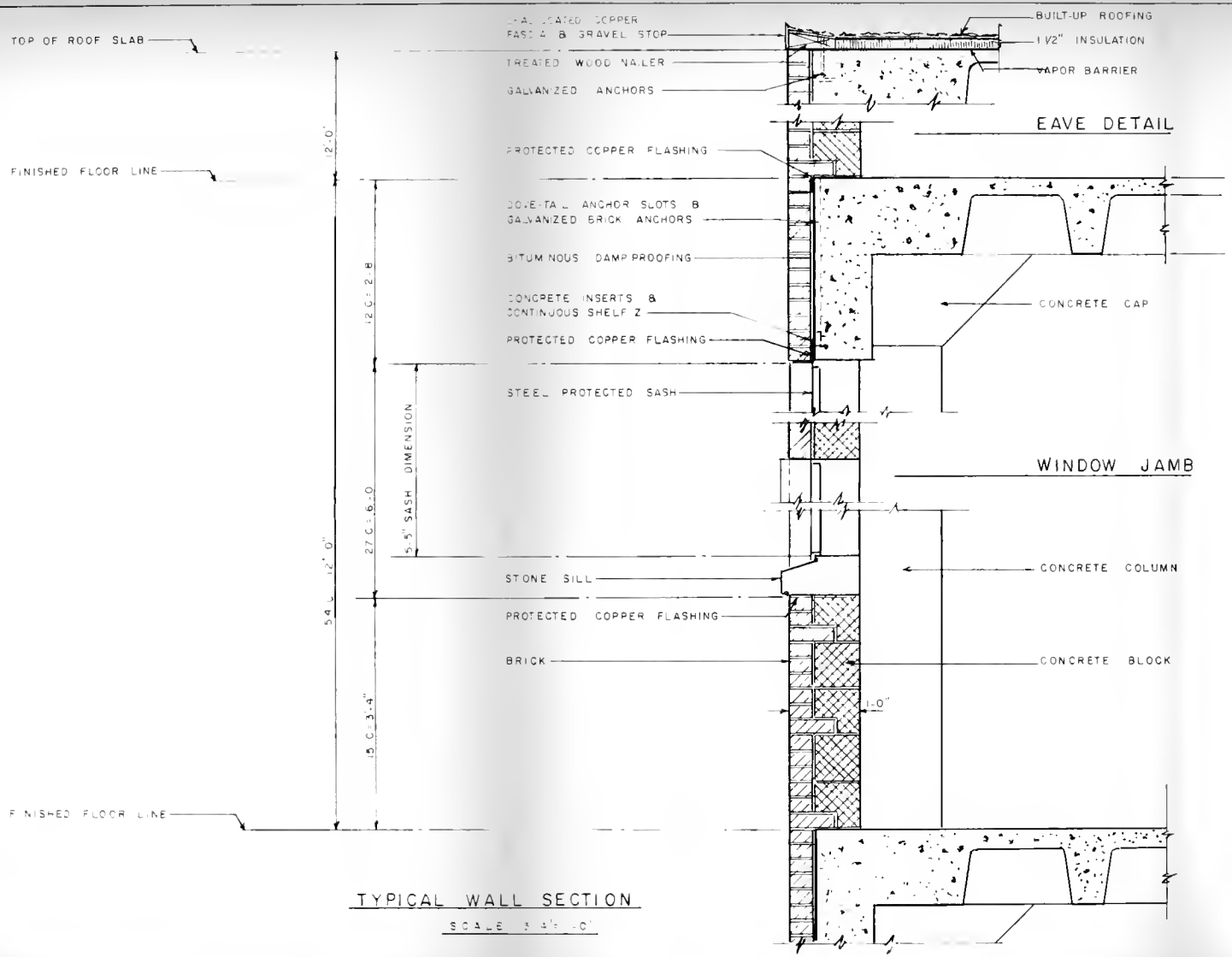
SIDE ELEVATION

SCALE 1/16"=1'-0"

PROTOTYPE MULTI-STORY MANUFACTURING PLANT
SOUTH END BOSTON

HESTER BROWNE & ASSOCIATES, INC.
ARCHITECTS ENGINEERS
128 ARLINGTON ST. BOSTON

A-10 B.R.A. INDUSTRIAL DEVELOPMENT STUDY



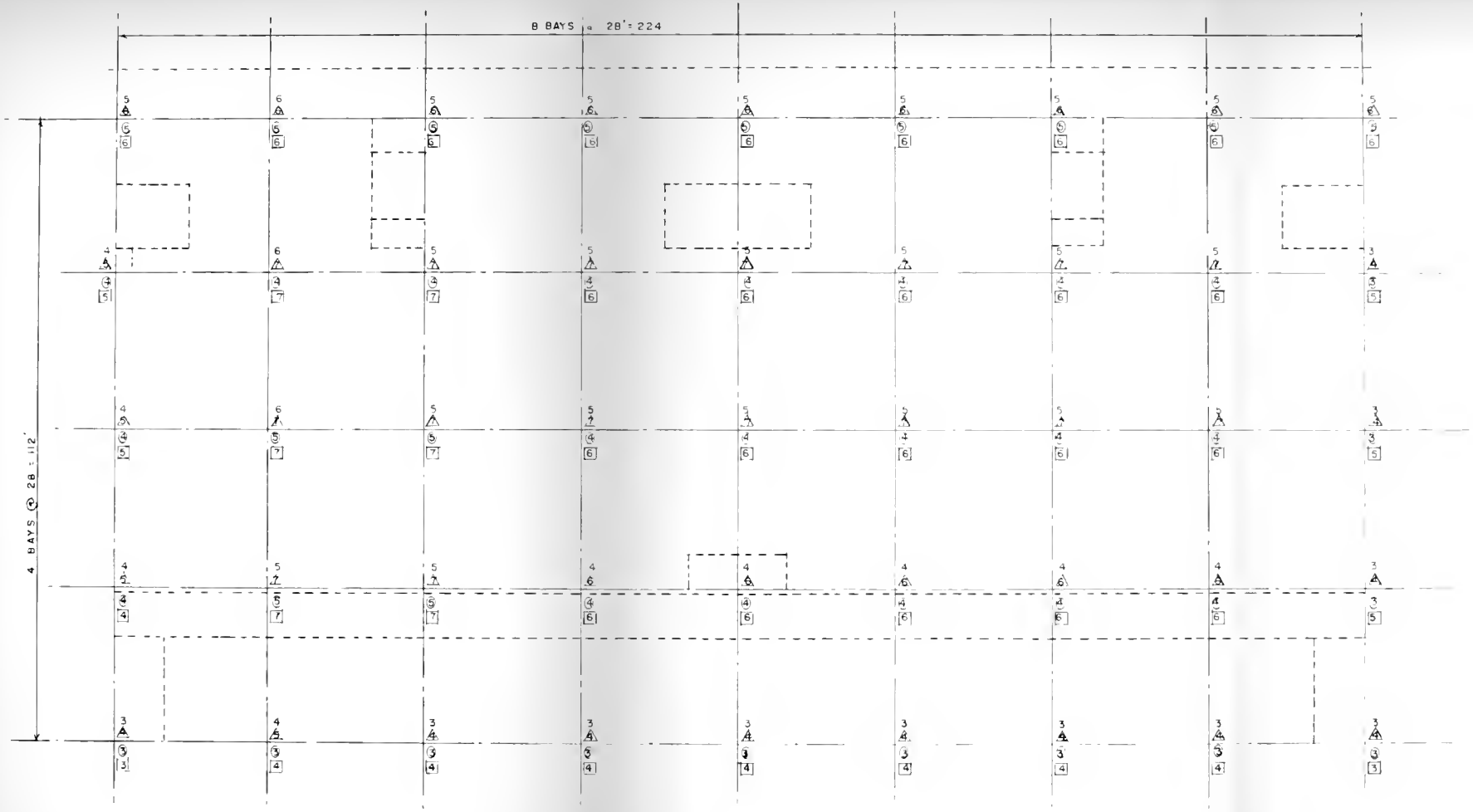
TYPICAL WALL SECTION

SCALE 3/4" = 1'-0"

PROTOTYPE MULTI-STORY MANUFACTURING PLANT
SOUTH END BOSTON

W. CHESTER BROWNE & ASSOCIATES, INC.
ARCHITECTS ENGINEERS
22-128 ARLINGTON ST. BOSTON

A-11 | B.R.A. INDUSTRIAL DEVELOPMENT STUDY



SCALE 1/16" = 1'-0"

FIGURES SHOWN THUS - 6 INDICATE NUMBER OF PILES FOR A 4 STORY FLAT SLAB BUILDING AT EACH COLUMN LOCATION

" " " 6 " " " " " " " " " " " " " " "

" " " 4 " " " " " " " " " " " " " " "

" " " 6 GRID FLAT SLAB " " " " " " " "

PROTOTYPE MULTI-STORY MANUFACTURING PLANT

SOUTH END BOSTON

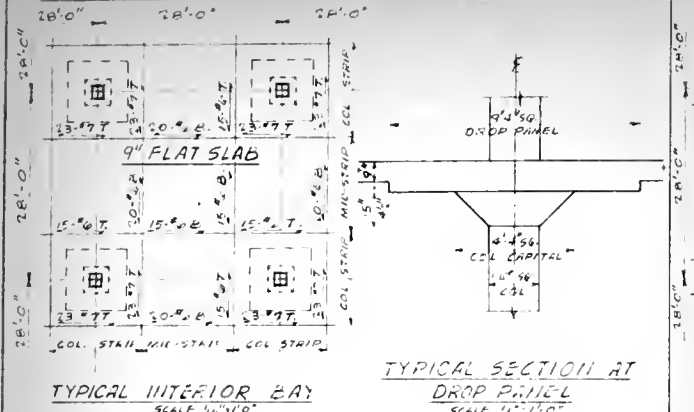
W. CHESTER BROWNE & ASSOCIATES, INC.

ARCHITECTS ENGINEERS

122-128 ARLINGTON ST. BOSTON

S-1 B.R.A. INDUSTRIAL DEVELOPMENT STUDY

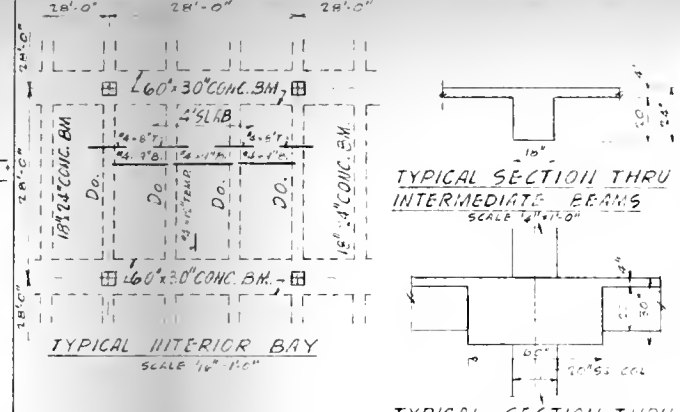
SCHEME #1 - CONCRETE FLAT SLAB WITH DROP PANELS



TYPICAL INTERIOR BAY
SCALE 1/8"=1'-0"

TYPICAL SECTION AT DROP PANEL
SCALE 1/4"=1'-0"

SCHEME #2 - CONCRETE BEAM AND SLAB



TYPICAL INTERIOR BAY
SCALE 1/8"=1'-0"

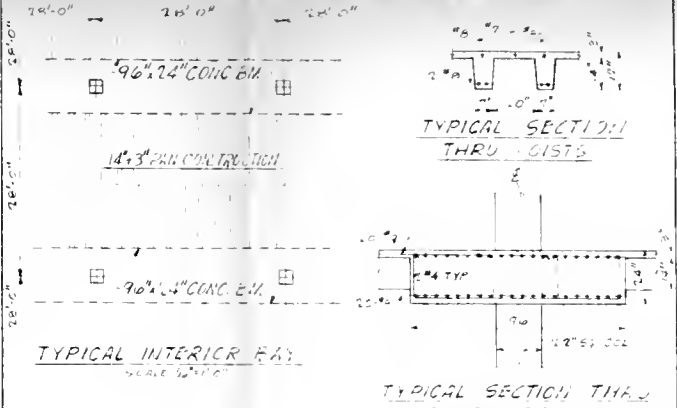
TYPICAL SECTION THRU INTERMEDIATE BEAMS
SCALE 1/4"=1'-0"

TYPICAL SECTION THRU MAIN BEAMS
SCALE 1/4"=1'-0"

INTERMEDIATE BEAM REINF.
7 #9 @ 6" CTRS. TOP & BOTTOM, #3 STIRRUPS @ 12" CTRS.

MAIN BEAM REINF.
18 #11 CONT. TOP & BOTTOM, #4 STIRRUPS @ 12" CTRS.

SCHEME #3 - CONCRETE JOIST AND BEAM

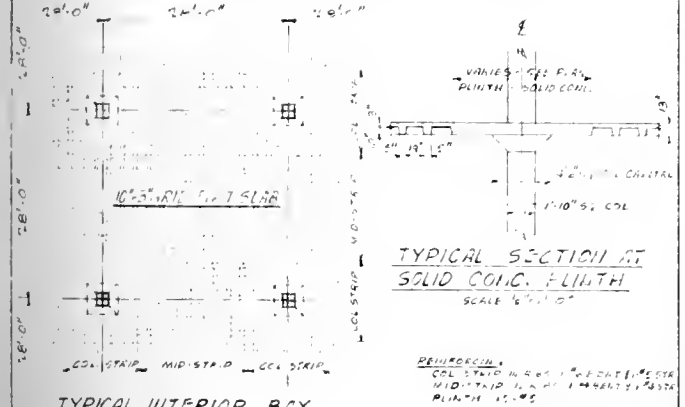


TYPICAL INTERIOR BAY
SCALE 1/8"=1'-0"

TYPICAL SECTION THRU JOISTS

TYPICAL SECTION THRU CONC. BEAM
SCALE 1/2"=1'-0"

SCHEME #4 - 2 WAY GRID FLAT SLAB



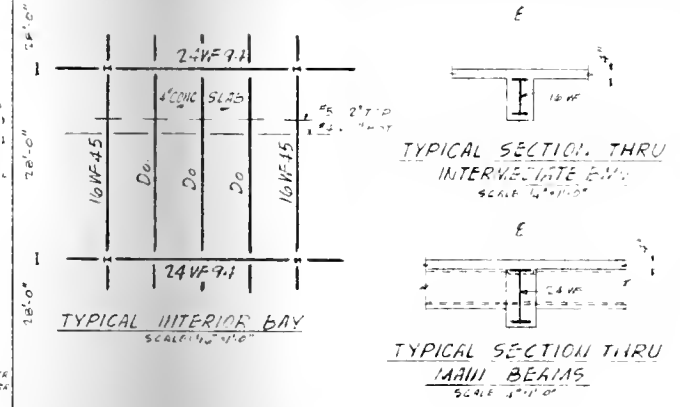
TYPICAL INTERIOR BAY
SCALE 1/8"=1'-0"

NOTE: DOMES 14" WIDE - 10" DEEP @ 5" MIN. TOPPING

TYPICAL SECTION AT SOLID CONC. PLINTH
SCALE 1/2"=1'-0"

REINFORCING:
COL. STRIP IN E-W DIR. 7 #9 CONT. IN ESTR. MID-STRIP IN E-W DIR. 4 #9 CONT. IN ESTR.
PLINTH 15 #9'S

SCHEME #5 - CONCRETE SLAB ON FIBERGLASS ST BEAMS

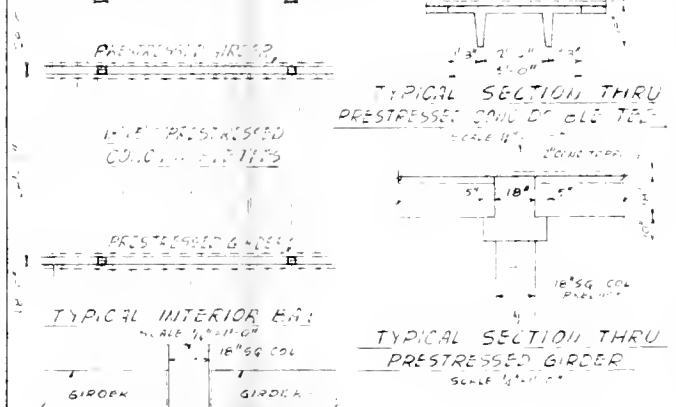


TYPICAL INTERIOR BAY
SCALE 1/8"=1'-0"

TYPICAL SECTION THRU INTERMEDIATE BMS
SCALE 1/2"=1'-0"

TYPICAL SECTION THRU MAIN BEAMS
SCALE 1/2"=1'-0"

SCHEME #6 - PRESTRESSED DOUBLE TEES W/ PRESTRESSED GIRDERS



TYPICAL INTERIOR BAY
SCALE 1/8"=1'-0"

ELEV OF PRESTRESSED GIRDER AT COL
SCALE 1/8"=1'-0"

TYPICAL SECTION THRU PRESTRESSED CONC DBL TEE
SCALE 1/2"=1'-0"

TYPICAL SECTION THRU PRESTRESSED GIRDER
SCALE 1/2"=1'-0"

COST ESTIMATE

SCHEME #1

REINF.	$ 0.75 P.S.F.
CONCRETE	$ 0.60 P.S.F.
FORMS	$ 0.68 P.S.F.
TOTAL COST PER SQ. FT.	$ 2.03

SCHEME #2

REINF.	$ 0.62 P.S.F.
CONCRETE	$ 0.77 P.S.F.
FORMS	$ 1.26 P.S.F.
TOTAL COST PER SQ FT	$ 2.65

SCHEME #3

REINF.	$ 0.69 P.S.F.
CONCRETE	$ 0.74 P.S.F.
FORMS	$ 0.74 P.S.F.
TOTAL COST PER SQ FT.	$ 2.43

SCHEME #4

REINF.	$ 0.51 P.S.F.
CONCRETE	$ 0.56 P.S.F.
FORMS	$ 0.74 P.S.F.
TOTAL COST PER SQ. FT.	$ 1.81

SCHEME #5

STRUCTURAL STEEL	$ 1.10 P.S.F.
REINF.	$ 0.16 P.S.F.
CONC.	$ 0.21 P.S.F.
FORMS	$ 0.83 P.S.F.
COLUMN	$ 0.19 P.S.F.
TOTAL COST PER SQ FT.	$ 2.69

SCHEME #6

PRESTRESSED TEES	$ 1.20 P.S.F.
CONC. TOPPING	$ 0.25 P.S.F.
PRESTRESSED GIRDER	$ 0.99 P.S.F.
PRECAST COLUMN	$ 0.23 P.S.F.
TOTAL COST PER SQ FT	$ 2.97

NOTE: ALL SCHEMES ARE BASED ON A LIVE LOAD OF 150 P.S.F.

FOR PLACE TOPPING SCHEMES FOR 4" SLAB USE 2" INTERIOR & 3" EXT.

B.R.A. INDUSTRIAL DEVELOPMENT STUDY
SOUTH END BOSTON

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ALBERT GOLDBERG AND ASSOCIATES
STRUCTURAL ENGINEERS

S-2 B.R.A. INDUSTRIAL DEVELOPMENT STUDY